Citrix ADC 13.1 Advanced Policy Expression Reference

To construct an expression by using this document, start by clicking one of the prefixes listed below.Then, select an expression from the list of available expressions and click the "Returns" link to view the expressions that you can further apply on the data.

AAA	Denotes the AAA context of the current transaction.
ANALYTICS	Provides access to analytics information and operations.
CLIENT	Designates an expression that refers to the client. This is the starting point for access into parameters such as Ether and SSL.
CONNECTION	Designates an expression that refers to network packet irrespective of flow
DIAMETER	Models the DIAMETER message.
DNS	Models the DNS message.
EXTEND	Extends the target area around the matched pattern.
HTTP	Models the HTTP message.
ICA	Models the ICA protocol.
ICAP	Models the ICAP message.
MQTT	Models the MQTT message.
MSSQL	Models the MSSQL protocol.
MYSQL	Models the MYSQL protocol.

ORACLE	Models the ORACLE protocol.
QUIC	Models the QUIC message.
RADIUS	Models the RADIUS message.
SERVER	Designates an expression that refers to the server. This is the starting point for access into parameters such as Ether and SSL.
SIP	Models the SIP protocol.
SMPP	Models the SMPP protocol.
SUBSCRIBER	Models the Subscriber database attributes.
SYS	Designates an expression that refers to the NetScaler, rather than the client or server.
TARGET	Refers to the matched pattern.
TEXT	Operates on selected text.
URL	URL provides operations for parsing and operating on the URL. The supported format is [<protocol>://<hostname>]<path>[?<query>]. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.</query></path></hostname></protocol>

AAA_AUTHENTICATION_T

Operates on AAA authentication information.

This topic lists the expressions that are provided by this class.

- `ERROR`

  Returns error encountered in current authentication factor.

`Returns:` authentication_error_e

- `NONCE`

  Returns nonce for current authentication factor.

`Returns:` text_t

AAA_LOGIN_T

Operates on AAA login request information

This topic lists the expressions that are provided by this class.

- `CLIENT_MAC_ADDR`

  Returns one MAC address at a time (sequentially) from the list of MAC addresses returned by a client as part of the MAC-ADDR header.

`Returns:` text_t

- `DOMAIN`

  Returns the domain of the user. This is the domain used at the time of login

`Returns:` text_t

- `PASSWORD`

  Returns the password of the user. This is the password used at the time of login

`Returns:` text_t

- `PASSWORD2`

  Returns the password2 of the user. This is the password2 used at the time of login

`Returns:` text_t

- `RELAYSTATE`

  Returns the relaystate value, which is fetched from the SAML Response. It may return NULL if relaystate in the response is empty

`Returns:` text_t

- `SAML_REQ_ACS_URL`

Returns the ACS URL received in the SAML Request associated with the current login request. The value is extracted at the time of processing the SAML Request. Returns NULL if the SAML Request or the ACS URL is not found.

`Returns:` text_t

- `USERNAME`

  Returns the name of the user. This is the name used at the time of login

`Returns:` text_t

`VALUE` (text_t name)

Returns the value associated with the parameter name. The value is extracted at the time of login from the name-value pair within the POST body

`Parameters` (expressions not allowed)`:`

name- the name of the name-value pair whose value is to be extracted

`Returns:` text_t

AAA_T

Operates on AAA information.

This topic lists the expressions that are provided by this class.

- `AUTHENTICATION`

  Returns AAA authentication information.

`Returns:` aaa_authentication_t

- `LOGIN`

  Returns the AAA login request information.

`Returns:` aaa_login_t

- `USER`

  Returns the AAA User associated with the current transaction.

`Returns:` aaa_user_t

AAA_USER_T

Represents the AAA User Information.

This topic lists the expressions that are provided by this class.

`ATTRIBUTE` (`uint` index)

Returns USER's attribute stored at a given index. For example: HTTP.REQ.USER.ATTRIBUTE(1) gives the value of a previously extracted attribute that is stored as 'attribute1'. Index range is between 1 and 16, both included.

`Parameters``:`

index- offset

`Returns:` text_t

`ATTRIBUTE` (text_t name)

Returns USER's attribute stored with a given name. For example: HTTP.REQ.USER.ATTRIBUTE("name") gives the value of a previously extracted attribute that is stored as 'attribute\["name"\]'.

`Parameters``:`

name- name used for extracting corresponding attribute value

`Returns:` text_t

- `AUTH_STRENGTH`

  Returns an integer that represents the strength of authentication of the current user session.

`Returns:` num_at

- `DOMAIN`

  Returns the Domain of the user.

`Returns:` text_t

- `EXTERNAL_GROUPS`

  Operate as a List on the External Groups which is seperated by ','. For example: HTTP.REQ.USER.EXTERNAL_GROUPS gives list of all groups which are ',' seperated.

`Returns:` list_t

`EXTERNAL_GROUPS` (`char` sep)

Operate as a List on the Group which is seperated by given delimiter. For example: HTTP.REQ.USER.EXTERNAL_GROUPS(':') gives list of all external groups which are ':' seperated.

`Parameters` (expressions not allowed) `:`

sep- delimiter

`Returns:` list_t

- `GROUPS`

  Operate as a List on the Group which is seperated by ','. For example: HTTP.REQ.USER.GROUPS gives list of all groups which are ',' seperated. In this list first internal groups are listed which are followed by external groups.

`Returns:` list_t

`GROUPS_AS_XML` (text_t tag)

Gives the list of groups in a SAML assertion multi-attribute format, each enclosed by an element that has the specified tagname. For example: HTTP.REQ.USER.GROUPS_AS_XML("mytagname"): the expression will return a list of groups in the following format - financeengg In this example, finance, engg are the group names.

`Parameters``:`

tag- tagname

`Returns:` text_t

`GROUPS` (`char` sep)

Operate as a List on the Group which is seperated by given delimiter. For example: HTTP.REQ.USER.GROUPS(':') gives list of all groups which are ':' seperated. In this list first internal groups are listed which are followed by external groups.

`Parameters` (expressions not allowed) `:`

sep- delimiter

`Returns:` list_t

- `INTERNAL_GROUPS`

  Operate as a List on the Group which is seperated by ','. For example: HTTP.REQ.USER.INTERNAL_GROUPS gives list of all groups which are ',' seperated.

`Returns:` list_t

`INTERNAL_GROUPS` (`char` sep)

Operate as a List on the Group which is seperated by given delimiter. For example: HTTP.REQ.USER.INTERNAL_GROUPS(':') gives list of all internal groups which are ':' seperated.

`Parameters` (expressions not allowed) `:`

sep- delimiter

`Returns:` list_t

`IS_MEMBER_OF_ALL` (text_t patset_name)

Returns TRUE if all patterns(group string) of the patset matches user's groups in session

`Parameters` (expressions not allowed) `:`

patset_name- patset Name

`Returns:` bool_at

`IS_MEMBER_OF_ANY` (text_t patset_name)

Returns TRUE if there is at least one pattern(group string) of the patset matches user's groups in session

`Parameters` (expressions not allowed) `:`

patset_name- patset Name

`Returns:` bool_at

`IS_MEMBER_OF` (text_t group_name)

Returns TRUE if the user is a member of the group group_name

`Parameters` (expressions not allowed) `:`

group_name- Group Name

`Returns:` bool_at

- `LOGIN_ATTEMPTS`

  Return the number of failed login attempts for the current user. User name is extracted from current authentication process.

`Returns:` num_at

`LOGIN_ATTEMPTS` (text_t username)

Return the number of failed login attempts for the given user.

`Parameters` (expressions not allowed) `:`

username- the name of the user to get the information for.

`Returns:` num_at

- `LOGIN_NAME`

  Returns the NAME that is provided by user at the time of login.

`Returns:` text_t

- `NAME`

  Returns the NAME of the user. This is the name used by user for login unless it is overriden by name from external authentication server.

`Returns:` text_t

- `OAUTHIDP_CC_FLOW`

  Returns true if the AAA session is in the OAuth IDP CC Flow. This is used during authentication of the user when the AAA server acts as an IDP and the Relaying Party is Citrix Cloud. Note

that this expression works only if the corresponding OAuth IDP profile is configured with a default group.

`Returns:` bool_at

- `OAUTHIDP_FLOW`

  Returns true if the AAA session is in the OAuth IDP Flow. This is used during authentication of the user when the AAA server acts as an IDP. Note that this expression works only if the corresponding OAuth IDP profile is configured with a default group.

`Returns:` bool_at

- `PASSWD`

  Returns the PASSWORD of the user.

`Returns:` text_t

- `SAMLIDP_FLOW`

  Returns true if the AAA session is in the SAML IDP Flow. This is used during authentication of the user when the AAA server acts as an IDP. Note that this expression works only if the corresponding SAML IDP profile is configured with a default group.

`Returns:` bool_at

- `SESSIONID`

  Returns the Session ID of the user.

`Returns:` text_t

ALPN_T

ALPN extension in client hello message of SSL handshake.

This topic lists the expressions that are provided by this class.

`HAS_NEXTPROTOCOL` (text_t nextproto)

Returns true if ALPN extension in the client hello message has given next protocol.

`Parameters` (expressions not allowed) `:`

nextproto- ALPN protocol

`Returns:` bool_at

ANALYTICS_T

Designates an expression that refers to the analytics. This is the starting point for access into parameters such as stream.

This topic lists the expressions that are provided by this class.

- `CONNECTION_QUALITY`

  Accesses Connection Quality Analytics metrics evaluated for client.

`Returns:` cqa_t

`STREAM` (text_t identifier_name)

Operates on a stream identifier specified in the stream method.

`Parameters` (expressions not allowed) `:`

identifier_name- Name of the stream identifier added using add stream identifier.

`Returns:` stream_t

AUTH_KEYID_T

Represents the Authority Key Identifier Extension of the X509V3 certificate.

This topic lists the expressions that are provided by this class.

- `CERT_SERIALNUMBER`

  Returns the SerialNumber field of the Authority Key Identifier as a blob.

`Returns:` text_t

- `EXISTS`

  Returns boolean TRUE if the Authority Key Identifier extension exists in the certificate, otherwise returns boolean FALSE.

`Returns:` bool_at

- `ISSUER_NAME`

  Returns the Issuer Distinguished Name as a '/' seperated Name-Value pair list, where '=' seperates the Name and the Value. Example: /C=IN/ST=KA/L=BLR/O=Netscaler Pvt Ltd/OU=www.netscaler.com/CN=www.netscaler.com/emailAddress=ns@ns.com

`Returns:` nvlist_t

- `KEYID`

  Returns the keyIdentifier field of the Authority Key Identifier as a blob.

`Returns:` text_t

AUTHENTICATION_ERROR_E

This object represents one of the error codes that is encountered during authentication.

Enumerations

INVALID_CREDS

This error represents invalid credentials presented for authentication.

NOT_PERMITTED

This error represents user is not permitted to login.

SYS_TIMEOUT

This error represents timeout during authentication process at external authentication server.

SYS_ERROR

This error represents processing error at external authentication server.

SOCKET_ERROR

This error represents connection error at external authentication server.

BAD_USER

This error represents login attempt for invalid username.

BAD_PASSWORD

This error represents login attempt for invalid password.

MISMATCH_PASSWORD

This error represents password mismatch for current login attempt.

INVALID_USER

This error represents username used for login does not exist or incorrect.

RESTRICTED_HOURS

This error represents login attempt in restricted time.

ACCOUNT_DISABLED

This error represents account is disabled for current user.

PASSWORD_EXPIRED

This error represents password is expired for the current user.

NO_DIALIN_PERM

This error represents user does not have dial-in permissions.

CHANGE_PASSWORD

This error represents error while trying to change password.

ACCOUNT_LOCKED

This error represents user's account is locked out.

This topic lists the expressions that are provided by this class.

`EQ` (authentication_error_e e)

The result is Boolean TRUE if the input argument is equal to the error presented by this object.

`Parameters` (expressions not allowed) `:`

e- Authentication Error enumeration

`Returns:` bool_at

`NE` (authentication_error_e e)

The result is Boolean TRUE if the input argument is not equal to the error presented by this object.

`Parameters` (expressions not allowed) `:`

e- Authentication Error enumeration

`Returns:` bool_at

AVP_T

Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `AVPLIST_AFTER`

  Returns the region after this AVP in diameter message (or in other words returns location at end of this AVP and length covering end of this AVP to end of diameter message. If this AVP is inside a Grouped AVP, this method returns region after this AVP in parent Grouped AVP.

`Returns:` text_t

`*AVPLIST_BEFORE`

Returns the region till this AVP in diameter message (or in other words returns location at start of AVPs and length equal to offset of this AVP). If this AVP is inside a Grouped AVP, this method returns region till this AVP in parent AVP.

`Returns:` text_t

`*AVP` (`uint` avpcode)

Returns the AVP nested inside the GROUPED AVP (the Data field is a sequence of AVPs).

For example, to retrieve AVP(263) that is nested in AVP(99999) in a request, the expression is: DIAMETER.REQ.AVP(999999).AVP(263).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` avp_t

`*AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP in given vendor-id namespace and that is nested inside a GROUPED AVP in the message.

For example, to get the AVP with code 1005 and VendorId 10415 from a Request, that is nested inside 1001 (vendor-id 10415). Use this expression: DIAMETER.REQ.AVP(1001, 10415).AVP(1004, 10415).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor Id

`Returns:` avp_t

`*COUNT`

Returns the number of occurences of an AVP in diameter message. The system does not keep track of more than 16 AVP occurences of an AVP. The result will be undefined if there are more than 16 instances of that AVP.

`Returns:` num_at

`*EXISTS`

Returns true if the AVP exists in the message.

`Returns:` bool_at

`*INSTANCE` (`uint` instanceno)

Returns instances of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: DIAMETER.REQ.AVP(266). However, subsequent instances must be retrieved using this method.

INSTANCE(0) retrieves the first instance, INSTANCE(1) retrieves the second instance, and so on.

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the second instance, the expression would be: DIAMETER.REQ.AVP(282).INSTANCE(1).

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` avp_t

`*IS_MANDATORY`

Returns true if the AVP has the Mandatory bit set.

`Returns:` bool_at

`*IS_VENDOR_SPECIFIC`

Returns true if the AVP has Vendor-Specific bit (V) set.

`Returns:` bool_at

`*LENGTH`

Returns the AVP length including AVP header.

If the AVP is not present, it returns length 0. If multiple occurences of the AVP exist, it returns the length of first occurence.

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert avp_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*VALUE`

Returns the value of first instance of the AVP as OctetString..

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the first instance, the expression would be: DIAMETER.REQ.AVP(282).VALUE.

Alternatively, you can use the expression: DIAMETER.REQ.AVP(282).

`Returns:` text_t

`*VALUE` (`uint` instanceno)

Returns value of an instance of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: DIAMETER.REQ.AVP(266). However, subsequent instances must be retrieved using this method.

VALUE(0) retrieves the first instance, VALUE(1) retrieves the second instance, and so on.

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the second instance, the expression would be: DIAMETER.REQ.AVP(282).VALUE(1).

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` text_t

`*VENDOR_ID`

Returns the Vendor ID if the AVP has the Vendor-Specific bit set.

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within

the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

Based on RFC2396, following are considered URL safe characters:

Alpha-numeric characters: a-z, A-Z, 0-9

Hyphen and underscore: "-", "_"

Dot: "."

Exclamation mark: "!"

Tilde: "~"

Asterix: "*"

Single quote: "'"

Open and close parentheses: "(", ")"

Semi-colon: ";"

Colon: ":"

At symbol: "@"

Question mark: "?"

Equals: "="

Dollar: "$"

Percent: "%"

Ampersand: "&"

Plus: "+"

Comma: ","

Forward slash: ".html"

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` avp_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` avp_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

AVP_UNUM_T

In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from avp_t unsigned_long_at

- `TYPECAST_AVP_T`

  Convert avp_unum_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert avp_unum_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*ABS`

Return absolute double value of the double value.

`Returns:` double_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current unsigned long.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*AVPLIST_AFTER`

Returns the region after this AVP in diameter message (or in other words returns location at end of this AVP and length covering end of this AVP to end of diameter message. If this AVP is inside a Grouped AVP, this method returns region after this AVP in parent Grouped AVP.

`Returns:` text_t

`*AVPLIST_BEFORE`

Returns the region till this AVP in diameter message (or in other words returns location at start of AVPs and length equal to offset of this AVP). If this AVP is inside a Grouped AVP, this method returns region till this AVP in parent AVP.

`Returns:` text_t

`*AVP` (`uint` avpcode)

Returns the AVP nested inside the GROUPED AVP (the Data field is a sequence of AVPs).

For example, to retrieve AVP(263) that is nested in AVP(99999) in a request, the expression is: DIAMETER.REQ.AVP(999999).AVP(263).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` avp_t

`*AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP in given vendor-id namespace and that is nested inside a GROUPED AVP in the message.

For example, to get the AVP with code 1005 and VendorId 10415 from a Request, that is nested inside 1001 (vendor-id 10415). Use this expression: DIAMETER.REQ.AVP(1001, 10415).AVP(1004, 10415).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor Id

`Returns:` avp_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Unsigned Long Value after bitwise negating the current unsigned long value.

`Returns:` unsigned_long_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*COUNT`

Returns the number of occurences of an AVP in diameter message. The system does not keep track of more than 16 AVP occurences of an AVP. The result will be undefined if there are more than 16 instances of that AVP.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed)`:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed)`:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EXISTS`

Returns true if the AVP exists in the message.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"
```

```
Question mark: "?"

Equals: "="

Dollar: "$"

Percent: "%"

Ampersand: "&"

Plus: "+"

Comma: ","

Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` instanceno)

Returns instances of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: DIAMETER.REQ.AVP(266). However, subsequent instances must be retrieved using this method.

INSTANCE(0) retrieves the first instance, INSTANCE(1) retrieves the second instance, and so on.

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the second instance, the expression would be: DIAMETER.REQ.AVP(282).INSTANCE(1).

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` avp_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_MANDATORY`

Returns true if the AVP has the Mandatory bit set.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_VENDOR_SPECIFIC`

Returns true if the AVP has Vendor-Specific bit (V) set.

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Returns the AVP length including AVP header.

If the AVP is not present, it returns length 0. If multiple occurences of the AVP exist, it returns the length of first occurence.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Unsigned Long Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 64.

`Parameters``:`

i- Left Shift Length

`Returns:` unsigned_long_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Double Value after negating the current double value.

`Returns:` double_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +
```

```
"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Unsigned Long Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 64.

`Parameters``:`

i- Right Shift Length

`Returns:` unsigned_long_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` avp_unum_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` avp_unum_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Unsigned Long Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Typecast the Unsigned Long Value to a Number value.

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Typecast the Unsigned Long Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE`

Returns the value of first instance of the AVP as OctetString..

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the first instance, the expression would be: DIAMETER.REQ.AVP(282).VALUE.

Alternatively, you can use the expression: DIAMETER.REQ.AVP(282).

`Returns:` text_t

`*VALUE` (`uint` instanceno)

Returns value of an instance of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: DIAMETER.REQ.AVP(266). However, subsequent instances must be retrieved using this method.

VALUE(0) retrieves the first instance, VALUE(1) retrieves the second instance, and so on.

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the second instance, the expression would be: DIAMETER.REQ.AVP(282).VALUE(1).

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` text_t

`*VENDOR_ID`

Returns the Vendor ID if the AVP has the Vendor-Specific bit set.

`Returns:` unsigned_long_at

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",
```

```
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
```

```
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
```

```
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

BINARY_ENCODING_E

Defines the binary encodings available for the ENCRYPT(), DECRYPT(), and HMAC() functions.

Enumerations

BASE64

Original PEM base64-encoding: 6 bits (0..63) enocded as one ASCII character: 0..23 = 'A'..'Z', 24..51 = 'a'..'z', 52..61 = '0'..'9', 62 = '+', 63 = '/', '=' = pad byte. Four bytes encoded as three characters. CR/LF every 64 characters.

BASE64URL

URL and Filename safe base64-encoding: same as BASE64 except 62 = '-', 63 = '_' and no CR/LFs. Pad byte? Can be used in URLs without requiring escaping.

HEX_UPPER

Hexadecimal with 0..9 = '0'..'9' and 10..15 = 'A'..'F'.

HEX_LOWER

Hexadecimal with 0..9 = '0'..'9' and 10..15 = 'a'..'f'.

HEX_COLONS

Hexadecimal with 0..9 = '0'..'9' and 10..15 = 'A'..'F'; ':' between each hex byte. Matches BLOB_TO_HEX() output format.

HEX

Hexadecmimal: For input, accepts HEX_UPPER, HEX_LOWER, and HEX_COLONS format. For output, produces HEX_LOWER format.

NONE

No encoding: input or output text is raw binary.

BOOL_AT

Boolean Operations

This topic lists the expressions that are provided by this class.

`AND` (bool_at b)

Logical AND the boolean argument with the current boolean result.

`Parameters``:`

b- Boolean

`Returns:` bool_at

`APPEND` (text_t str)

Appends the given string to the string representation of the current boolean.

`Parameters``:`

str- the string to append.

`Returns:` text_t

- `NOT`

  Logical NOT the current boolean result.

`Returns:` bool_at

`OR` (bool_at b)

Logical OR the boolean argument with the current boolean result.

`Parameters``:`

b- Boolean

`Returns:` bool_at

- `TYPECAST_TEXT_T`

  Typecast the Boolean Value to its string representation.

`Returns:` text_t

CHARSET_E

Character Set Enum

Enumerations

ASCII

UTF_8

CIPHER_T

SSL CIPHER IN CLIENT HELLO

This topic lists the expressions that are provided by this class.

`HAS_HEXCODE` (`uint` code)

Returns true if the cipher stream has the hex code passed in the argument.

`Parameters` (expressions not allowed) `:`

code- Cipher Hex Code

`Returns:` bool_at

CLIENT_HELLO_T

Client Hello SSL

This topic lists the expressions that are provided by this class.

- `ALPN`

  Operates on ALPN extension present in the client hello message.

`Returns:` alpn_t

- `CIPHERS`

  Returns the supported ciphers proposed by the client in the client hello message.

`Returns:` cipher_t

- `CLIENT_VERSION`

  Returns the version from the message-header of the client hello message.

`Returns:` num_at

- `IS_RENEGOTIATE`

  Returns true if renegotiation is initiated in ongoing SSL session, else returns false.

`Returns:` bool_at

- `IS_REUSE`

  Returns true if reuse is proposed by client, else returns false.

`Returns:` bool_at

- `IS_SCSV`

  Returns true if in client hello SCSV (Signalling Cipher Suite Value) is advertised, else returns false. SCSV prevents protocol downgrade attack.

`Returns:` bool_at

- `IS_SESSION_TICKET`

  Returns true if in client hello session ticket is advertised, else returns false.

`Returns:` bool_at

- `LENGTH`

  Returns the length in the message-header of the client hello message.

`Returns:` num_at

- `SNI`

  Returns SNI from CLIENT HELLO In the case of non-SSL transaction or error in client hello, returns an empty string.

`Returns:` ssl_text_t

CLIENT_T

Designates an expression that refers to the client. This is the starting point for access into paramters such as Ether and SSL.

This topic lists the expressions that are provided by this class.

- `ETHER`

  Operates on the ethernet protocol data associated with the current packet.

`Returns:` ether_req_protocol_t

- `INTERFACE`

  Designates an expression that refers to the ID of the network interface through which the current packet entered the Application Switch.

`Returns:` interface_req_t

- `IP`

  Operates on the IP protocol data associated with the current packet.

`Returns:` ip_req_protocol_t

- `IPV6`

  Operate on the IPv6 protocol data.

`Returns:` ipv6_req_protocol_t

- `PROXY`

  Operates on Proxy protocol data associated with current connection.

`Returns:` proxy_protocol_info_t

- `SSL`

  Operates on the SSL protocol data for the current packet.

`Returns:` ssl_req_protocol_t

- `SSLVPN`

  Operates on the SSLVPN data for the current packet.

`Returns:` sslvpn_req_protocol_t

- `TCP`

  Operate on the TCP protocol data.

`Returns:` tcp_req_protocol_t

- `TRAFFIC_DOMAIN`

  Operates on the Traffic Domain through which the current packet entered the Application Switch.

`Returns:` traffic_domain_req_t

- `UDP`

  Operates on the UDP protocol data associated with the current packet.

`Returns:` udp_req_protocol_t

- `VLAN`

  Operates on the VLAN through which the current packet entered the Application Switch.

`Returns:` vlan_req_t

- `VXLAN`

  Operates on the VXLAN through which the current packet entered the Application Switch.

`Returns:` vxlan_req_t

COOKIE_T

The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t nvlist_at

- `DOMAIN`

  Obtain the value of Domain field of the cookie. If Multiple Domain fields are present the value associated with the first instance is returned. For eg: Set-Cookie : Customer = "ABC"; DOMAIN=".abc.com"; DOMAIN=.xyz.com then HTTP.RES.SET_COOKIE.COOKIE("CUSTOMER").DOMAIN gives .abc.com . Note that the quotes are stripped and value is returned. String of zero length is returned in the following cases: 1) If the Domain field is not present. 2) If the Value of Domain field is not present.

`Returns:` text_t

`*EXPIRES`

Obtain the Expires field of the cookie which is date string. The value of the Expires attribute can be operated upon as a Time object. The Time object supports a number of date formats. If multiple Expires fields are present then the first one is returned. If the Expires attribute is absent then Text of length zero will be returned.

`Returns:` time_t

`*PATH`

Obtain the value of Path field of the cookie, which is a '/' separated list (Multiple / are treated as single /). If Multiple path fields are present the value associated with the first instance is returned. For eg: Set-Cookie : Customer = "ABC"; PATH="/a//b/c"; PATH= "/x/y/z" then HTTP.RES.SET_COOKIE.COOKIE("CUSTOMER").PATH gives /a//b/c. HTTP.RES.SET_COOKIE.COOKIE("CUSTOMER").PATH.GET(2) gives b. Note that the quotes are stripped and value is returned. String of zero length is returned in the following cases: 1) If the Path field is not present. 2) If the value of Path field is not present.

`Returns:` list_t

`*PORT`

Obtain the value of PORT field of the cookie. Operate as a ',' separated List on the PORT component of the COOKIE. For eg: Set-Cookie : Customer = "ABC"; PATH="/a/b/c"; PORT= "80, 2580" then HTTP.RES.SET_COOKIE.COOKIE("ABC").PORT gives 80, 2580. Note that the quotes are stripped and value is returned. String of zero length is returned in the following cases: 1) If the Port field is not present. 2) If the value of Port field is not present.

`Returns:` list_t

`*TYPECAST_TEXT_T`

Convert cookie_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*VERSION`

Obtain the Value of Version field of the cookie which is a decimal integer. If Multiple version fields are present the value associated with the first instance after the COOKIE name-value pair is returned. For eg: Set-Cookie : Customer = "ABC"; VERSION = "1"; VERSION = "0" then HTTP.RES.SET_COOKIE.COOKIE("CUSTOMER").VERSION gives 1. Note that the quotes are stripped and value is returned. Default numerical value zero is returned in the following cases: 1) If the version field is not present. 2) If the value of version field is not present. 3) If the version value is not a decimal number.

`Returns:` num_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*COUNT`

Return a Number Value giving the number of name-value components in the list. If the last Name-Value List component is of zero length or is all spaces then it is ignored.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

Based on RFC2396, following are considered URL safe characters:

Alpha-numeric characters: a-z, A-Z, 0-9

Hyphen and underscore: "-", "_"

Dot: "."

Exclamation mark: "!"

Tilde: "~"

Asterix: "*"

Single quote: "'"

Open and close parentheses: "(", ")"

Semi-colon: ";"

Colon: ":"

At symbol: "@"

Question mark: "?"

Equals: "="

Dollar: "$"

Percent: "%"

Ampersand: "&"

Plus: "+"

Comma: ","

Forward slash: ".html"

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NAMES`

Extracts a list of only the names from the name-value pair list. For example the list 'a=b,c="d=e,f",g=h' will result in the list 'a,c,g'. Empty elements will be ignored.

`Returns:` list_t

`*NAME` (`uint` i)

Operate as Text on the name component of the specified name-value component in the list. The index of the name-value component given by the argument is 0-based. If the specified index is greater than the number of components then a zero length Text object is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*NAME_VALUE` (`uint` i)

Returns the element in the list identified by the parameter. The parameter is a 0-based index in to the list. The result is a string. If the specified index is greater than the number of components then a zero length string is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*NAME_VALUE` (text_t name)

Operate as Text on the name-value component in the list. The name-value component is specified by the argument by providing the name whose name-value is needed. The first component that matches the name is selected. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` text_t

`*NAME_VALUE` (text_t name, `uint` i)

Operate as Text on the name-value component in the list. The name-value component is specified by the argument by providing the name whose name-value is needed. In a name-value list the same name can be repeated multiple times. The Index argument controls which occurence of the matching name-value component should be selected. The Index is 0-based. If the Index is too big then the Text object that is produced will have zero length. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

i- Index

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XXDP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AUnw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </ RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*REPLACE_ALL_VALUES` (text_t value)

Replaces all the values in each name-value pair with the specified string argument. For example, given argument string "?" the list 'a=b,c=d,e=f' will result in the name-value list 'a=?,c=?,e=?'. Quotes will be stripped from the values being replaced. Empty values will be replaced with the value provided. Empty elements will be preserved.

`Parameters` (expressions not allowed) `:`

value- value to replace existing values

`Returns:` nvlist_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` cookie_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus

character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` cookie_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).

- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUES`

Extracts a list of only the values from the name-value pair list. For example the list 'a=b,c=d,e=f' will result in the list 'b,d,f'. Note that lists do not honor the quote characters, so any nvlist_at entry that has quotes and a quoted entry includes a separator will be split at that embedded separator. Quote characters will not be stripped from the values. Empty elements and empty values will be ignored.

`Returns:` list_t

`*VALUE` (`uint` i)

Operate as Text on the value component of the specified name-value component in the list. The index of the name-value component given by the argument is 0-based. If the specified index is greater than the number of components then a zero length Text object is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*VALUE` (text_t name)

Operate as Text on the value component of the specified name-value component in the list. The name-value component is specified by the argument by providing the name whose value is needed. The first component that matches the name is selected. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` text_t

`*VALUE` (text_t name, `uint` i)

Operate as Text on the value component of the specified name-value component in the list. The name-value component is specified by the argument by providing the name whose value is needed. In a name-value list the same name can be repeated multiple times. The Index argument controls which occurence of the matching name-value component should be selected. The Index is 0-based. If the Index is too big then the Text object that is produced will have zero length. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

i- Index

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",
```

```
            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>
```

```
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
```

```
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

CQA_T

Retrieves Conection Quality Analytics parameters calculated for current client.

This topic lists the expressions that are provided by this class.

- `CONGESTION_LEVEL`

  Gets detected congestion level. This returns an integer, in the range 0 to 100, that provides a measure of network congestion level. The greater the value, the the higher the detected congestion level is.

`Returns:` num_at

- `NETWORK_TYPE`

  Gets the detected network type. This should be a string of the detected nework type label (such as "2G", "3G", "4G", etc.) as defined in cqaparam configuration (parameters -net1label, -net2label and -net3label). Sets the text mode to case insensitive.

`Returns:` text_t

- `SIGNAL_QUALITY`

  Gets detected signal quality. This returns an integer, in the range 0 to 100, that provides a measure of client signal quality. The greater the value, the the better the signal quality is.

`Returns:` num_at

DIAMETER_FLAG_E

This object represents one of the diameter flags.

Enumerations

REQUEST

PROXIABLE

ERROR

RETRANSMIT

RESERVED_4

RESERVED_5

RESERVED_6

RESERVED_7

DIAMETER_FLAG_T

Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

`IS_SET` (diameter_flag_e flag)

Test a flag bit (REQUEST, PROXIABLE, ERROR or RETRANSMIT) in diameter message.

`Parameters` (expressions not allowed) `:`

flag- flag bit

`Returns:` bool_at

`*RESET_ALL`

Reset flag bits in diameter message. Returns diameter_flag_t which allows further set/unset of other bits in this flag

`Returns:` diameter_flag_t

`*SET` (diameter_flag_e flag)

Set a flag bit (REQUEST, PROXIABLE, ERROR or RETRANSMIT) in diameter message. Returns diameter_flag_t which allows further set/unset of other bits in this flag

`Parameters` (expressions not allowed) `:`

flag- flag bit

`Returns:` diameter_flag_t

`*TYPECAST_TEXT_T`

Convert diameter_flag_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*UNSET` (diameter_flag_e flag)

Unset a flag bit (REQUEST, PROXIABLE, ERROR or RETRANSMIT) in diameter message. Returns diameter_flag_t which allows further set/unset of other bits in this flag

`Parameters` (expressions not allowed) `:`

flag- flag bit

`Returns:` diameter_flag_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data

from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of

SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/

IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/

7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` diameter_flag_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character

using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` diameter_flag_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

DIAMETER_MESSAGE_T

Define common operations for Diameter.Req or Diameter.Res.

This topic lists the expressions that are provided by this class.

- `ACCOUNTING_SUB_SESSION_ID`

  Returns the Accounting-Sub-Session-Id AVP (code 287) from the message.

`Returns:` avp_t

- `ACCT_APPLICATION_ID`

  Returns the Acct-Application-Id AVP (code 259) from the message. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

- `ACCT_MULTI_SESSION_ID`

  Returns the Acct-Multi-Session-Id AVP (code 50) from the message.

`Returns:` avp_t

- `ACCT_SESSION_ID`

  Returns the Acct-Session-ID AVP (code 44) from the message.

`Returns:` avp_t

- `APPLICATION_ID`

  Returns the Application-ID from the message.

`Returns:` unum_text_t

- `AUTH_APPLICATION_ID`

  Returns the Auth-Application-Id AVP (code 258) from the message. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

- `AVP_END`

  Returns the location at the end of Diameter message (or in other words end of all AVPs) in Diameter message.

`Returns:` text_t

- `AVP_LIST`

  Returns the AVP region in Diameter message (or in other words returns location at start of AVPs and length equal to Diameter message length excluding header).

`Returns:` text_t

`AVP` (`uint` avpcode)

Returns the specified AVP from the message.

For example, to get the AVP with code 263 from a Request, use the expression: DIAMETER.REQ.AVP(263).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` avp_t

`AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP in given vendor-id namespace from the message.

For example, to get the AVP with code 1001 and VendorId 10415 from a Request, use the expression: DIAMETER.REQ.AVP(1001, 10415).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor Id

`Returns:` avp_t

- `AVP_START`

  Returns the location at the start of AVPs (or in other words end of diameter header) in Diameter message.

`Returns:` text_t

- `COMMAND_CODE`

  Returns the Command Code from the message.

`Returns:` unum_text_t

- `END_TO_END_ID`

  Returns the End-to-End Identifier from the message.

`Returns:` unsigned_long_at

- `FLAGS`

  Returns the value of Diameter Header flags in Diameter message.

`Returns:` diameter_flag_t

- `HOP_BY_HOP_ID`

  Returns the Hop-by-Hop Identifier from the message.

`Returns:` unsigned_long_at

- `IS_PROXIABLE`

  Returns true if the P (proxiable) command flag is set for the message.

`Returns:` bool_at

- `LENGTH`

  Returns the Message Length from the message.

`Returns:` num_at

- `ORIGIN_HOST`

Returns the Origin-Host AVP (code 264) from the message.

`Returns:` avp_t

- `ORIGIN_REALM`

  Returns the Origin-Realm AVP (code 296) from the message.

`Returns:` avp_t

- `PRODUCT_NAME`

  Returns the Product-Name AVP (code 269) from the message.

`Returns:` avp_t

- `SESSION_ID`

  Returns the Session-ID AVP (code 263) from the message.

`Returns:` avp_t

- `SUPPORTED_VENDOR_ID`

  Returns the Supported-Vendor-Id AVP (code 265) from the message.

`Returns:` avp_t

- `USER_NAME`

  Returns the User-Name AVP (code 1) from the message.

`Returns:` avp_t

- `VENDOR_ID`

  Returns the Vendor-Id AVP (code 266) from the message.

`Returns:` avp_t

- `VENDOR_SPECIFIC_APPLICATION_ID`

  Returns the Vendor-Specific-Application-Id AVP (code 260) from the message.

`Returns:` vendor_spec_appid_avp_t

- `VERSION`

Returns the version of the Diameter protocol. Currently, Diameter supports only version 1.

`Returns:` unum_text_t

DIAMETER_PROTOCOL_T

Provides expressions to retrieve Diameter header information and Diameter Header and AVPs (attribute value pairs) from Diameter requests and responses.

`Note:` The Diameter implementation is RFC 6733 compliant.

This topic lists the expressions that are provided by this class.

- `IS_CLIENT`

  Returns true if this is a Diameter client connection.

`Returns:` bool_at

- `IS_SERVER`

  Returns true if this is a Diameter server connection.

`Returns:` bool_at

- `NEW_ANSWER`

  Creates new Diameter Response Message (Header only) based on Request header.

`Returns:` text_t

`NEW_ANSWER` (bool_at error, ip_address_at command_code, ip_address_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, ip_address_at command_code, num_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, ip_address_at command_code, time_local_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, ip_address_at command_code, time_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, ip_address_at command_code, unsigned_long_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, num_at command_code, ip_address_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, num_at command_code, num_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, num_at command_code, time_local_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, num_at command_code, time_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, num_at command_code, unsigned_long_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_local_at command_code, ip_address_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_local_at command_code, num_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_local_at command_code, time_local_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_local_at command_code, time_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_local_at command_code, unsigned_long_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_at command_code, ip_address_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_at command_code, num_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_at command_code, time_local_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_at command_code, time_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, time_at command_code, unsigned_long_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, unsigned_long_at command_code, ip_address_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, unsigned_long_at command_code, num_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, unsigned_long_at command_code, time_local_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, unsigned_long_at command_code, time_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_ANSWER` (bool_at error, unsigned_long_at command_code, unsigned_long_at application_id)

Creates new Diameter Message (Header only) based on given parameters.

`Parameters``:`

error- Error flag

command_code- Command associated with the Diameter message

application_id- Application id to be used in Diameter Header

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, double_at avpvalue)

Creates new AVP based on given avp code and given Float32 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, ip_address_at avpvalue)

Creates new AVP based on given avp code and given Float32 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, num_at avpvalue)

Creates new AVP based on given avp code and given Float32 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, time_local_at avpvalue)

Creates new AVP based on given avp code and given Float32 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, time_at avpvalue)

Creates new AVP based on given avp code and given Float32 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, unsigned_long_at avpvalue)

Creates new AVP based on given avp code and given Float32 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, double_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float32 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, ip_address_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float32 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, num_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float32 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, time_local_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float32 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, time_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float32 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT32` (`uint` avpcode, unsigned_long_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float32 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, double_at avpvalue)

Creates new AVP based on given avp code and given Float64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, ip_address_at avpvalue)

Creates new AVP based on given avp code and given Float64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, num_at avpvalue)

Creates new AVP based on given avp code and given Float64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, time_local_at avpvalue)

Creates new AVP based on given avp code and given Float64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, time_at avpvalue)

Creates new AVP based on given avp code and given Float64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, unsigned_long_at avpvalue)

Creates new AVP based on given avp code and given Float64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, double_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, ip_address_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, num_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, time_local_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, time_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_FLOAT64` (`uint` avpcode, unsigned_long_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Float64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_INTEGER32` (`uint` avpcode, num_at avpvalue)

Creates new AVP based on given avp code and given Integer32 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER32` (`uint` avpcode, num_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Integer32 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, ip_address_at avpvalue)

Creates new AVP based on given avp code and given Integer64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, num_at avpvalue)

Creates new AVP based on given avp code and given Integer64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, time_local_at avpvalue)

Creates new AVP based on given avp code and given Integer64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, time_at avpvalue)

Creates new AVP based on given avp code and given Integer64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, unsigned_long_at avpvalue)

Creates new AVP based on given avp code and given Integer64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, ip_address_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Integer64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, num_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Integer64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, time_local_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Integer64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, time_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Integer64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, unsigned_long_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Integer64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP` (`uint` avpcode, text_t avpvalue)

Creates new AVP based on given avp code and given value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value as octet string

`Returns:` text_t

`NEW_AVP` (`uint` avpcode, text_t avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value as octet string

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_UNSIGNED32` (`uint` avpcode, `uint` avpvalue)

Creates new AVP based on given avp code and given Unsigned32 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED32` (`uint` avpcode, `uint` avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Unsigned32 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, ip_address_at avpvalue)

Creates new AVP based on given avp code and given Unsigned64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, num_at avpvalue)

Creates new AVP based on given avp code and given Unsigned64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, time_local_at avpvalue)

Creates new AVP based on given avp code and given Unsigned64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, time_at avpvalue)

Creates new AVP based on given avp code and given Unsigned64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, unsigned_long_at avpvalue)

Creates new AVP based on given avp code and given Unsigned64 value. Vendor-Specific and Mandatory bit are not set.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, ip_address_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Unsigned64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, num_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Unsigned64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, time_local_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Unsigned64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, time_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Unsigned64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, unsigned_long_at avpvalue, bool_at is_mandatory, `uint` vendor_id)

Creates new AVP based on given avp code and given Unsigned64 value. Set the 'M' and 'V' bits, and vendor_id field for this AVP.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

is_mandatory- 'true' to set The 'M' bit in AVP

vendor_id- vendor_id field. non-zero vendor_id sets the 'V' bit and fills the vendor_id field in AVP as given.

`Returns:` text_t

- `NEW_ERROR_ANSWER`

  Creates new Diameter Error Response Message (Header only) based on Request header.

`Returns:` text_t

`NEW_REDIRECT` (text_t redirectUri)

Creates new Diameter Redirect Response Message (Header only) based on Request header. This Redirect message will not have Redirect-Host-Usage and Redirect-Max-Cache-Time AVP.

`Parameters` (expressions not allowed)`:`

redirectUri- Redirect-Host AVP value

`Returns:` text_t

`NEW_REDIRECT` (text_t redirectUri, `uint` hostUsage, `uint` maxCacheTime)

Creates new Diameter Redirect Response Message (Header only) based on Request header. Use hostUsage and maxCacheTime parameters to insert Redirect-Host-Usage and Redirect-Max-Cache-Time AVP as defined in RFC 6733 section-6.13 (http://tools.ietf.org/md/rfc6733#section-6.13)

`Parameters` (expressions not allowed)`:`

redirectUri- Redirect-Host AVP value

hostUsage- Redirect-Host-Usage AVP value

maxCacheTime- Redirect-Max-Cache-Time AVP value.

`Returns:` text_t

- `REQ`

  Retrieves header information and AVPs from Diameter requests.

`Returns:` diameter_req_t

- `RES`

  Retrieves header information and AVPs from Diameter responses.

`Returns:` diameter_res_t

DIAMETER_REQ_T

Retrieves header information and AVPs from Diameter requests.

AVPs can be retrieved by:

- Directly specifying the AVP codes in the form: DIAMETER.REQ.AVP( ). For example, to retrieve the Auth-Application-Id AVP (code 258), you can use the expression: DIAMETER.REQ.AVP(258).
- Using aliases that are provided for important AVPs. For example, the Auth-Application-Id AVP has the alias AUTH_APPLICATION_ID. So, the expression to retrieve the Auth-Application-Id AVP by using the alias is DIAMETER.REQ.AUTH_APPLICATION_ID.

`General usage:` DIAMETER.REQ.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from diameter_message_t

- `DESTINATION_HOST`

  Returns the Destination-Host AVP (code 293) from the request.

`Returns:` avp_t

`*DESTINATION_REALM`

Returns the Destination-Realm AVP (code 283) from the request.

`Returns:` avp_t

`*IS_RETRANSMIT`

Returns true if the T (potentially retransmitted message) command flag is set for the request.

`Returns:` bool_at

`*TYPECAST_DIAMETER_MESSAGE_T`

Convert diameter_req_t to diameter_message_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_message_t : Define common operations for Diameter.Req or Diameter.Res.)

`Returns:` diameter_message_t

`*ACCOUNTING_SUB_SESSION_ID`

Returns the Accounting-Sub-Session-Id AVP (code 287) from the message.

`Returns:` avp_t

`*ACCT_APPLICATION_ID`

Returns the Acct-Application-Id AVP (code 259) from the message. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

`*ACCT_MULTI_SESSION_ID`

Returns the Acct-Multi-Session-Id AVP (code 50) from the message.

`Returns:` avp_t

`*ACCT_SESSION_ID`

Returns the Acct-Session-ID AVP (code 44) from the message.

`Returns:` avp_t

`*APPLICATION_ID`

Returns the Application-ID from the message.

`Returns:` unum_text_t

`*AUTH_APPLICATION_ID`

Returns the Auth-Application-Id AVP (code 258) from the message. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

`*AVP_END`

Returns the location at the end of Diameter message (or in other words end of all AVPs) in Diameter message.

`Returns:` text_t

`*AVP_LIST`

Returns the AVP region in Diameter message (or in other words returns location at start of AVPs and length equal to Diameter message length excluding header).

`Returns:` text_t

`*AVP` (`uint` avpcode)

Returns the specified AVP from the message.

For example, to get the AVP with code 263 from a Request, use the expression: DIAMETER.REQ.AVP(263).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` avp_t

`*AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP in given vendor-id namespace from the message.

For example, to get the AVP with code 1001 and VendorId 10415 from a Request, use the expression: DIAMETER.REQ.AVP(1001, 10415).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor Id

`Returns:` avp_t

`*AVP_START`

Returns the location at the start of AVPs (or in other words end of diameter header) in Diameter message.

`Returns:` text_t

`*COMMAND_CODE`

Returns the Command Code from the message.

`Returns:` unum_text_t

`*END_TO_END_ID`

Returns the End-to-End Identifier from the message.

`Returns:` unsigned_long_at

`*FLAGS`

Returns the value of Diameter Header flags in Diameter message.

`Returns:` diameter_flag_t

`*HOP_BY_HOP_ID`

Returns the Hop-by-Hop Identifier from the message.

`Returns:` unsigned_long_at

`*IS_PROXIABLE`

Returns true if the P (proxiable) command flag is set for the message.

`Returns:` bool_at

`*LENGTH`

Returns the Message Length from the message.

`Returns:` num_at

`*ORIGIN_HOST`

Returns the Origin-Host AVP (code 264) from the message.

`Returns:` avp_t

`*ORIGIN_REALM`

Returns the Origin-Realm AVP (code 296) from the message.

`Returns:` avp_t

`*PRODUCT_NAME`

Returns the Product-Name AVP (code 269) from the message.

`Returns:` avp_t

`*SESSION_ID`

Returns the Session-ID AVP (code 263) from the message.

`Returns:` avp_t

`*SUPPORTED_VENDOR_ID`

Returns the Supported-Vendor-Id AVP (code 265) from the message.

`Returns:` avp_t

`*USER_NAME`

Returns the User-Name AVP (code 1) from the message.

`Returns:` avp_t

`*VENDOR_ID`

Returns the Vendor-Id AVP (code 266) from the message.

`Returns:` avp_t

`*VENDOR_SPECIFIC_APPLICATION_ID`

Returns the Vendor-Specific-Application-Id AVP (code 260) from the message.

`Returns:` vendor_spec_appid_avp_t

`*VERSION`

Returns the version of the Diameter protocol. Currently, Diameter supports only version 1.

`Returns:` unum_text_t

DIAMETER_RES_T

Retrieves header information and AVPs from Diameter responses.

AVPs can be retrieved by:

- Directly specifying the AVP codes in the form: DIAMETER.RES.AVP( ). For example, to retrieve the Auth-Application-Id AVP (code 258), you can use the expression: DIAMETER.RES.AVP(258).
- Using aliases that are provided for important AVPs. For example, the Auth-Application-Id AVP has the alias AUTH_APPLICATION_ID. So, the expression to retrieve the Auth-Application-Id AVP by using the alias is DIAMETER.RES.AUTH_APPLICATION_ID.

`General usage:` DIAMETER.RES.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from diameter_message_t

- `IS_ERROR`

  Returns true if the E (error) command flag is set for the response.

`Returns:` bool_at

`*REDIRECT_HOST`

Returns the Redirect-Host AVP (code 292) from the response.

`Returns:` avp_t

`*RESULT_CODE`

Returns the Result-Code AVP (code 268) from the response.

`Returns:` avp_t

`*TYPECAST_DIAMETER_MESSAGE_T`

Convert diameter_res_t to diameter_message_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_message_t : Define common operations for Diameter.Req or Diameter.Res.)

`Returns:` diameter_message_t

`*ACCOUNTING_SUB_SESSION_ID`

Returns the Accounting-Sub-Session-Id AVP (code 287) from the message.

`Returns:` avp_t

`*ACCT_APPLICATION_ID`

Returns the Acct-Application-Id AVP (code 259) from the message. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

`*ACCT_MULTI_SESSION_ID`

Returns the Acct-Multi-Session-Id AVP (code 50) from the message.

`Returns:` avp_t

`*ACCT_SESSION_ID`

Returns the Acct-Session-ID AVP (code 44) from the message.

`Returns:` avp_t

`*APPLICATION_ID`

Returns the Application-ID from the message.

`Returns:` unum_text_t

`*AUTH_APPLICATION_ID`

Returns the Auth-Application-Id AVP (code 258) from the message. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

`*AVP_END`

Returns the location at the end of Diameter message (or in other words end of all AVPs) in Diameter message.

`Returns:` text_t

`*AVP_LIST`

Returns the AVP region in Diameter message (or in other words returns location at start of AVPs and length equal to Diameter message length excluding header).

`Returns:` text_t

`*AVP` (`uint` avpcode)

Returns the specified AVP from the message.

For example, to get the AVP with code 263 from a Request, use the expression: DIAMETER.REQ.AVP(263).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` avp_t

`*AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP in given vendor-id namespace from the message.

For example, to get the AVP with code 1001 and VendorId 10415 from a Request, use the expression: DIAMETER.REQ.AVP(1001, 10415).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor Id

`Returns:` avp_t

`*AVP_START`

Returns the location at the start of AVPs (or in other words end of diameter header) in Diameter message.

`Returns:` text_t

`*COMMAND_CODE`

Returns the Command Code from the message.

`Returns:` unum_text_t

`*END_TO_END_ID`

Returns the End-to-End Identifier from the message.

`Returns:` unsigned_long_at

`*FLAGS`

Returns the value of Diameter Header flags in Diameter message.

`Returns:` diameter_flag_t

`*HOP_BY_HOP_ID`

Returns the Hop-by-Hop Identifier from the message.

`Returns:` unsigned_long_at

`*IS_PROXIABLE`

Returns true if the P (proxiable) command flag is set for the message.

`Returns:` bool_at

`*LENGTH`

Returns the Message Length from the message.

`Returns:` num_at

`*ORIGIN_HOST`

Returns the Origin-Host AVP (code 264) from the message.

`Returns:` avp_t

`*ORIGIN_REALM`

Returns the Origin-Realm AVP (code 296) from the message.

`Returns:` avp_t

`*PRODUCT_NAME`

Returns the Product-Name AVP (code 269) from the message.

`Returns:` avp_t

`*SESSION_ID`

Returns the Session-ID AVP (code 263) from the message.

`Returns:` avp_t

`*SUPPORTED_VENDOR_ID`

Returns the Supported-Vendor-Id AVP (code 265) from the message.

`Returns:` avp_t

`*USER_NAME`

Returns the User-Name AVP (code 1) from the message.

`Returns:` avp_t

`*VENDOR_ID`

Returns the Vendor-Id AVP (code 266) from the message.

`Returns:` avp_t

`*VENDOR_SPECIFIC_APPLICATION_ID`

Returns the Vendor-Specific-Application-Id AVP (code 260) from the message.

`Returns:` vendor_spec_appid_avp_t

`*VERSION`

Returns the version of the Diameter protocol. Currently, Diameter supports only version 1.

`Returns:` unum_text_t

DIGEST_METHOD_E

Defines the message digest methods allowed in DIGEST().

Enumerations

MD2

MD4

MD5

SHA1

SHA224

SHA256

SHA384

SHA512

DNS_DOMAINNAME_T

This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

`EQ` (text_t hostname)

Operates on the text contents of domainname. Results in Boolean TRUE value if the domainname matches the input argument. The comparison will be case-insensitive: if the domain name is "www.ForBar.com" then CLIENT.UDP.DNS.DOMAIN.EQ("www.forbar.com") returns TRUE. Similarly for DNS.REQ.QUESTION.DOMAIN.EQ("www.forbar.com").

`Parameters``:`

hostname- Hostname

`Returns:` bool_at

`*TYPECAST_TEXT_T`

Convert dns_domainname_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED,

NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed)`:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"
```

```
    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XXDP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AUnw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </ RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed)`:`

charset- Character Set

`Returns:` dns_domainname_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` dns_domainname_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has

same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code

258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the

current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses,

A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL

and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example:

HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

DNS_ECS_T

This object provides operations for parsing the DNS ECS option.

This topic lists the expressions that are provided by this class.

- `IP`

  Returns the representative IPv4 address of the 'address' field in EDNS client subnet.

`Returns:` ip_address_at

- `IPV6`

  Returns the representative IPv6 address of the 'address' field in EDNS client subnet.

`Returns:` ipv6_address_at

- `IS_IPV4`

  Returns true if EDNS client subnet option contains an IPv4 address

`Returns:` bool_at

- `IS_IPV6`

  Returns true if EDNS client subnet option contains an IPv6 address

`Returns:` bool_at

DNS_FLAG_E

This object represents one of the DNS header flags.

Enumerations

QR

AA

TC

RD

RA

RESERVED

AD

CD

DNS_FLAG_T

Provides operations to test/set/unset a flag in dns header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `GET_STRING_REPRESENTATION`

  Return all the flag bits set in the DNS header in string format

`Returns:` text_t

`*IS_SET` (dns_flag_e flag)

Test a flag bit in dns header.

`Parameters` (expressions not allowed) `:`

flag- bit

`Returns:` bool_at

`*SET` (dns_flag_e flag)

Set a flag bit in the DNS header. Returns dns_flag_t

`Parameters` (expressions not allowed) `:`

flag- bit

`Returns:` dns_flag_t

`*TYPECAST_TEXT_T`

Convert dns_flag_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*UNSET` (dns_flag_e flag)

Unset a flag bit in the DNS header. Returns dns_flag_t

`Parameters` (expressions not allowed) `:`

flag- bit

`Returns:` dns_flag_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot

be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input

text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +
```

```
"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/

5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter

matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` dns_flag_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` dns_flag_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given

format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

DNS_HEADER_T

This object provides operations for parsing the DNS header.

This topic lists the expressions that are provided by this class.

- `ANCOUNT`

  Returns the answer count in the DNS header.

`Returns:` num_at

- `ARCOUNT`

  Returns the additional record count in the DNS header.

`Returns:` num_at

- `FLAGS`

  Returns the value of DNS header flags

`Returns:` dns_flag_t

- `NSCOUNT`

  Returns the nameserver count in the DNS header.

`Returns:` num_at

- `OPCODE`

  Return the opcode in the DNS header.

`Returns:` dns_opcode_t

- `QDCOUNT`

  Returns the question count in the DNS header.

`Returns:` num_at

- `RCODE`

  Return the response code of the DNS question

`Returns:` dns_rcode_t

DNS_OPCODE_E

This object provides operations for parsing the DNS header opcode.

Enumerations

QUERY

IQUERY

STATUS

NOTIFY

UPDATE

This topic lists the expressions that are provided by this class.

`EQ` (dns_opcode_e m)

The result is Boolean TRUE if the input argument is equal to the DNS opcode type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns opcode type

`Returns:` bool_at

`NE` (dns_opcode_e m)

The result is Boolean FALSE if the input argument is equal to the DNS opcode type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns opcode type

`Returns:` bool_at

DNS_OPCODE_T

This object provides Num operations and Dns OpcodeType Enum operations.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from dns_opcode_e num_at

`SET` (dns_opcode_e opcode)

Sets the specified opcode in the DNS header

`Parameters` (expressions not allowed) `:`

opcode- enum value

`Returns:` dns_opcode_t

`*TYPECAST_NUM_AT`

Convert dns_opcode_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (dns_opcode_e m)

The result is Boolean TRUE if the input argument is equal to the DNS opcode type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns opcode type

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (dns_opcode_e m)

The result is Boolean FALSE if the input argument is equal to the DNS opcode type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns opcode type

`Returns:` bool_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

DNS_OPT_T

This object provides operations for parsing the DNS OPT record.

This topic lists the expressions that are provided by this class.

- `ECS`

  Returns EDNS client subnet option (if exists).

`Returns:` dns_ecs_t

- `ECS_EXISTS`

  Returns true if EDNS client subnet option is present in the OPT record.

`Returns:` bool_at

DNS_PROTOCOL_T

Models the DNS message types.

This topic lists the expressions that are provided by this class.

- `LENGTH`

  Returns the DNS packet length. In case of DNS-TCP, it includes 2 byte length field as well.

`Returns:` num_at

- `NEW_RESPONSE`

  Creates an empty DNS response based on request header.

`Returns:` text_t

`NEW_RESPONSE` (bool_at AA, bool_at TC, dns_rcode_e rcode)

Creates a new empty DNS response based on the given parameters.

`Parameters` (expressions not allowed) `:`

AA- Authoritative Answer flag

TC- Truncated flag

rcode- Retrun Code

`Returns:` text_t

`NEW_RRSET_AAAA` (text_t iplist, `uint` ttl)

Creates a new RR set with the given ipv6 address and ttl parameters.

`Parameters` (expressions not allowed) `:`

iplist- Comma separated IPv6 address list

ttl- Time To Live

`Returns:` text_t

`NEW_RRSET_A` (text_t iplist, `uint` ttl)

Creates a new RR set with the given ipv4 address and ttl parameters.

`Parameters` (expressions not allowed) `:`

iplist- Comma separated IP address list

ttl- Time To Live

`Returns:` text_t

- `REQ`

  Operates on DNS Request.

`Returns:` dns_req_t

- `RES`

  Operates on DNS Response.

`Returns:` dns_res_t

- `RR`

  Operates on DNS Resource Record(RR).

`Returns:` dns_rr_t

DNS_QUESTION_T

This object provides operations for parsing the DNS question.

This topic lists the expressions that are provided by this class.

- `DOMAIN`

  Returns domain name. Sets the text mode to case insensitive.

`Returns:` dns_domainname_t

- `TYPE`

  Returns DNS Record type.

`Returns:` dns_type_t

DNS_RCODE_E

This object provides operations for parsing the DNS header response code.

Enumerations

NOERROR

FORMERR

SERVFAIL

NXDOMAIN

NOTIMP

REFUSED

This topic lists the expressions that are provided by this class.

`EQ` (dns_rcode_e m)

The result is Boolean TRUE if the input argument is equal to the DNS response code represented by this object.

`Parameters` (expressions not allowed) `:`

m- DNS response code

`Returns:` bool_at

`NE` (dns_rcode_e m)

The result is Boolean TRUE if the input argument is not equal to the DNS response code represented by this object.

`Parameters` (expressions not allowed) `:`

m- DNS response code

`Returns:` bool_at

DNS_RCODE_T

This object provides Num operations and Dns RcodeType Enum operations.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from dns_rcode_e num_at

`SET` (dns_rcode_e rcode)

Sets the specified rcode in the DNS header

`Parameters` (expressions not allowed) `:`

rcode- enum value

`Returns:` dns_rcode_t

`*TYPECAST_NUM_AT`

Convert dns_rcode_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (dns_rcode_e m)

The result is Boolean TRUE if the input argument is equal to the DNS response code represented by this object.

`Parameters` (expressions not allowed) `:`

m- DNS response code

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (dns_rcode_e m)

The result is Boolean TRUE if the input argument is not equal to the DNS response code represented by this object.

`Parameters` (expressions not allowed) `:`

m- DNS response code

`Returns:` bool_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

DNS_RDATA_T

This object provides operations for interpreting the data present in RDATA section of DNS Resource Record (RR).

This topic lists the expressions that are provided by this class.

- `IP`

  Returns the IP address from an A record.

`Returns:` ip_address_at

- `IPV6`

  Returns the IPV6 address from an AAAA record.

`Returns:` ipv6_address_at

DNS_REQ_T

Operates on DNS Request. This is the starting point for accessing request side dns packet

This topic lists the expressions that are provided by this class.

- `HEADER`

  Returns DNS request header information.

`Returns:` dns_header_t

- `OPT`

  Returns the OPT record (if it exists) in the additional section.

`Returns:` dns_opt_t

- `QUESTION`

  Returns DNS question which has domain and resource record information.

`Returns:` dns_question_t

- `TRANSPORT`

  Returns DNS transport layer protocol type.

`Returns:` dns_transport_e

DNS_RES_T

Operates on DNS Response. This is the starting point for accessing response side dns packet

This topic lists the expressions that are provided by this class.

- `HEADER`

  Returns DNS response header which contains response code information.

`Returns:` dns_header_t

- `OPT`

  Returns the OPT record (if it exists) in the additional section.

`Returns:` dns_opt_t

- `QUESTION`

  Returns DNS question which has domain and resource record information.

`Returns:` dns_question_t

- `TRANSPORT`

  Returns DNS transport layer protocol type.

`Returns:` dns_transport_e

DNS_RR_T

This object provides operations for parsing the DNS Resource Record (RR).

This topic lists the expressions that are provided by this class.

- `RDATA`

  Returns RDATA in the RR. Sets the text mode to case insensitive.

`Returns:` dns_rdata_t

- `TYPE`

  Returns The DNS Record type.

`Returns:` dns_type_e

DNS_TRANSPORT_E

This object provides DNS Transport information

Enumerations

TCP

UDP

This topic lists the expressions that are provided by this class.

`EQ` (dns_transport_e m)

The result is Boolean TRUE if the input argument is equal to the DNS transport protocol type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns transport protocol type

`Returns:` bool_at

`NE` (dns_transport_e m)

The result is Boolean FALSE if the input argument is equal to the DNS transport protocol type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns transport protocol type

`Returns:` bool_at

DNS_TYPE_E

This object provides operations for parsing the DNS resourse record type.

Enumerations

A

AAAA

ANY

CNAME

PTR

MX

NS

SRV

SOA

TXT

NAPTR

This topic lists the expressions that are provided by this class.

`EQ` (dns_type_e m)

The result is Boolean TRUE if the input argument is equal to the DNS record type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns record type

`Returns:` bool_at

`NE` (dns_type_e m)

The result is Boolean FALSE if the input argument is equal to the DNS record type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns record type

`Returns:` bool_at

DNS_TYPE_T

This object provides Num operations and DnsType Enum operations on the DNS Record Type.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from dns_type_e num_at

- `TYPECAST_NUM_AT`

  Convert dns_type_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (dns_type_e m)

The result is Boolean TRUE if the input argument is equal to the DNS record type represented by this object.

`Parameters` (expressions not allowed)`:`

m- Dns record type

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (dns_type_e m)

The result is Boolean FALSE if the input argument is equal to the DNS record type represented by this object.

`Parameters` (expressions not allowed) `:`

m- Dns record type

`Returns:` bool_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

DOUBLE_AT

Double Value

This topic lists the expressions that are provided by this class.

- `ABS`

  Return absolute double value of the double value.

`Returns:` double_at

`ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`ADD` (ip_address_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`ADD` (num_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`ADD` (time_local_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`ADD` (time_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`ADD` (unsigned_long_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`APPEND` (text_t str)

Appends the given string to the string representation of the current double.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`DIV` (ip_address_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`DIV` (num_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`DIV` (time_local_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`DIV` (time_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`DIV` (unsigned_long_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`EQ` (ip_address_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`EQ` (num_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`EQ` (time_local_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`EQ` (time_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`EQ` (unsigned_long_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GE` (ip_address_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GE` (num_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GE` (time_local_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GE` (time_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GE` (unsigned_long_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GT` (ip_address_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GT` (num_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GT` (time_local_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GT` (time_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`GT` (unsigned_long_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LE` (ip_address_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LE` (num_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LE` (time_local_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LE` (time_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LE` (unsigned_long_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LT` (ip_address_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LT` (num_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LT` (time_local_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LT` (time_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`LT` (unsigned_long_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MAX` (ip_address_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MAX` (num_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MAX` (time_local_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MAX` (time_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MAX` (unsigned_long_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MIN` (ip_address_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MIN` (num_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MIN` (time_local_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MIN` (time_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MIN` (unsigned_long_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MUL` (ip_address_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MUL` (num_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MUL` (time_local_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MUL` (time_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`MUL` (unsigned_long_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

- `NEG`

  Return the Double Value after negating the current double value.

`Returns:` double_at

`NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`NE` (ip_address_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`NE` (num_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`NE` (time_local_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`NE` (time_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`NE` (unsigned_long_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`SUB` (ip_address_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`SUB` (num_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`SUB` (time_local_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`SUB` (time_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`SUB` (unsigned_long_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

- `TYPECAST_NUM_AT`

Typecast the Double Value to a Number value.

`Returns:` num_at

- `TYPECAST_TEXT_T`

  Typecast the Double Value to its string representation.

`Returns:` text_t

- `TYPECAST_UNSIGNED_LONG_AT`

  Typecast the Double Value to a Unsigned Long value.

`Returns:` unsigned_long_at

DOUBLE_FORMAT_E

Double Format Enum

Enumerations

DECIMAL

Decimal representation of a positive or a negative double precisions floating point value. White spaces before and after the number are OK

DECIMAL_PREFIX

Decimal representation of a positive or a negative double precisions floating point value followed by arbitrary characters. Examples " -123.45" " 234e5 " "- 123e5abc" "234e5 abc"

DOUBLE_T

Provides operations to treat the underlying text as a Double

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t double_at

- `TYPECAST_DOUBLE_AT`

  Convert double_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_TEXT_T`

Convert double_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*ABS`

Return absolute double value of the double value.

`Returns:` double_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (num_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (time_local_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (time_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (unsigned_long_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current double.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (num_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (time_local_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (time_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (unsigned_long_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (num_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (time_local_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (time_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (unsigned_long_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (num_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (time_local_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (time_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (unsigned_long_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (num_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (time_local_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (time_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (unsigned_long_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*NEG`

Return the Double Value after negating the current double value.

`Returns:` double_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too

long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +
```

```
"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </

RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` double_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all

%HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` double_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (num_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (time_local_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (time_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (unsigned_long_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Typecast the Double Value to a Number value.

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Double Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

ENCRYPT_METHOD_E

Defines the encryption methods allowed in XML_ENCRYPT().

Enumerations

RC4

DES3

AES128

AES192

AES256

ENDIAN_E

Endianness Enum

Enumerations

LITTLE_ENDIAN

BIG_ENDIAN

ERROR_CATEGORY_E

This object represents one of the error categories.

Enumerations

ERR_AAA_GENERIC

This category identifies the scenario when a AAA submodule sends a legacy error number

ERR_AAA_ALLOC

This category identifies all memory allocation issue while processing AAA traffic.

ERR_AAA_C2C

This category of errors identifies the inter-node communication failures that happen while processing AAA traffic.

ERR_AAA_POLICY

This category of errors identifies the failure in policy subsystem while evaluation of policies.

ERR_AAA_CONFIG

This category of errors identifies all configuration issues while processing AAA traffic.

ERR_AAA_IIP

This category of errors identifies the issues while allocating intranet IP to a client.

ERR_AAA_AUTHN

This category of errors identifies the errors AAA module encounters while handling client authentication.

ERR_AAA_REASSEMBLY

This category of errors identifies the errors when AAA module tries to accumulate the post data.

ERR_AAA_NOSERVICE

This category of errors holds all the cases where AAA module fails to establish backend server connection.

ERR_AAA_UNAUTHORIZED

This error denotes a failed access to a resource

ERR_AAA_BAD_REQUEST

This error is set when AAA module sees a malformed message

ERR_AAA_PAGE_NOT_FOUND

This error is set when a request for a non-existent page is seen by AAA module

ERR_UNKNOWN

This category of errors is for all such errors for which category is unknown.

ERR_AAA_LOGIN_ATTEMPTS

This category of errors encompasses failures due to exceeding login attempts.

ERR_AAA_SAML

This category of errors represents all errors while processing SAML (Secure Assertion Markup Language) messages.

ERR_AAA_KERBEROS

This category of errors represents all errors while processing Kerberos messages.

AAA_LOGIN_REDIRECT

This category of errors represents all return codes while redirecting user for login.

This topic lists the expressions that are provided by this class.

`EQ` (error_category_e e)

The result is Boolean TRUE if the input argument is equal to the error presented by this object.

`Parameters` (expressions not allowed) `:`

e- Error enumeration

`Returns:` bool_at

`NE` (error_category_e e)

The result is Boolean TRUE if the input argument is not equal to the error presented by this object.

`Parameters` (expressions not allowed) `:`

e- Error enumeration

`Returns:` bool_at

ERROR_T

This object represents Error encountered while processing the last operation.

This topic lists the expressions that are provided by this class.

- `CATEGORY`

  Returns the error category.

`Returns:` error_category_e

ETHER_REQ_PROTOCOL_T

Provides access to MAC Address in Ethernet Requests.

This topic lists the expressions that are provided by this class.

- `DSTMAC`

  Returns MAC address present in the destination field of the Ethernet header. All MAC addresses are given as colon-delimited hexadecimal codes in the format ##:##:##:##:##:##. Valid values for each # include numbers 0-9 and letters A through F.

`Returns:` mac_address_at

- `ETHERTYPE`

  Returns the EtherType of the current Ethernet frame.

`Returns:` ether_type_t

- `SRCMAC`

  Returns MAC address present in the source field of the Ethernet header. All MAC addresses are given as colon-delimited hexadecimal codes in the format ##:##:##:##:##:##. Valid values for each # include numbers 0-9 and letters A through F.

`Returns:` mac_address_at

ETHER_RES_PROTOCOL_T

Provides access to MAC Address in Ethernet Response.

This topic lists the expressions that are provided by this class.

- `DSTMAC`

  Returns MAC address present in the destination field of the Ethernet header

`Returns:` mac_address_at

- `ETHERTYPE`

  Returns the EtherType of the current Ethernet frame.

`Returns:` ether_type_t

- `SRCMAC`

  Returns MAC address present in the source field of the Ethernet header

`Returns:` mac_address_at

ETHER_TYPE_E

This object represents one of the ether types.

Enumerations

PUP

IPV4

ARP

REVARP

IPV6

VLAN

ETHERTYPE_UNKNOWN

This topic lists the expressions that are provided by this class.

`EQ` (ether_type_e ethertype)

The result is Boolean TRUE if the input argument is equal to the ethertype represented by this object.

`Parameters` (expressions not allowed) `:`

ethertype- EtherType

`Returns:` bool_at

`NE` (ether_type_e ethertype)

The result is Boolean TRUE if the input argument is not equal to the ethertype represented by this object.

`Parameters` (expressions not allowed) `:`

ethertype- EtherType

`Returns:` bool_at

ETHER_TYPE_T

This object provides Num operations and EtherType Enum operations on the EtherType.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from ether_type_e num_at

- `TYPECAST_NUM_AT`

  Convert ether_type_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (ether_type_e ethertype)

The result is Boolean TRUE if the input argument is equal to the ethertype represented by this object.

`Parameters` (expressions not allowed)`:`

ethertype- EtherType

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (ether_type_e ethertype)

The result is Boolean TRUE if the input argument is not equal to the ethertype represented by this object.

`Parameters` (expressions not allowed) `:`

ethertype- EtherType

`Returns:` bool_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

HTTP_CACHE_CONTROL_T

This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from http_header_t nvlist_at

- `IS_INVALID`

  Returns TRUE or FALSE depending on whether invalid Cache-Control headers are present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_MAX_AGE`

Returns TRUE or FALSE depending on whether the "max-age" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_MAX_STALE`

Returns TRUE or FALSE depending on whether the "max-stale" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_MIN_FRESH`

Returns TRUE or FALSE depending on whether the "min-fresh" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_MUST_REVALIDATE`

Returns TRUE or FALSE depending on whether the "must-revalidate" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_NO_CACHE`

Returns TRUE or FALSE depending on whether the "no-cache" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_NO_STORE`

Returns TRUE or FALSE depending on whether the "no-store" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_NO_TRANSFORM`

Returns TRUE or FALSE depending on whether the "no-transform" Cache-Control header is present. However, HTTP.REQ.CACHE_CONTROL.IS_NO_TRANSFORM will always return false since the "no-transform" cache-control header can only be present in the response. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_ONLY_IF_CACHED`

Returns TRUE or FALSE depending on whether the "only-if-cached" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_PRIVATE`

Returns TRUE or FALSE depending on whether the "private" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_PROXY_REVALIDATE`

Returns TRUE or FALSE depending on whether the "proxy-revalidate" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_PUBLIC`

Returns TRUE or FALSE depending on whether the "public" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_S_MAXAGE`

Returns TRUE or FALSE depending on whether the "s-maxage" Cache-Control header is present. See RFC 2616 for more details.

`Returns:` bool_at

`*IS_UNKNOWN`

Returns TRUE or FALSE depending on whether unknown Cache-Control headers are present. See RFC 2616 for more details.

`Returns:` bool_at

`*MAX_AGE`

Returns the value of the HTTP Cache-Control header "maxage". If this header is absent or invalid, 0 is returned. See RFC 2616 for more details.

`Returns:` num_at

`*MAX_STALE`

Returns the value of the HTTP Cache-Control header "maxstale". If this header is absent or invalid, 0 is returned. See RFC 2616 for more details.

`Returns:` num_at

`*MIN_FRESH`

Returns the value of the HTTP Cache-Control header "min-fresh". If this header is absent or invalid, 0 is returned. See RFC 2616 for more details.

`Returns:` num_at

`*S_MAXAGE`

Returns the value of the HTTP Cache-Control header "s-maxage". If this header is absent or invalid, 0 is returned. See RFC 2616 for more details.

`Returns:` num_at

`*TYPECAST_HTTP_HEADER_T`

Convert http_cache_control_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : Typecast an HTTP Header object of a specific type to HTTP Header.For example: HTTP.REQ.CONTENT_LENGTH.TYPECAST_HTTP_HEADER_T)

`Returns:` http_header_t

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". HTTP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". HTTP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / HTTP/1.1\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

Return a Number Value giving the number of name-value components in the list. If the last Name-Value List component is of zero length or is all spaces then it is ignored.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This

function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"
```

```
Comma: ","

Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An HTTP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in HTTP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NAMES`

Extracts a list of only the names from the name-value pair list. For example the list 'a=b,c="d=e,f",g=h' will result in the list 'a,c,g'. Empty elements will be ignored.

`Returns:` list_t

`*NAME` (`uint` i)

Operate as Text on the name component of the specified name-value component in the list. The index of the name-value component given by the argument is 0-based. If the specified index is greater than the number of components then a zero length Text object is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*NAME_VALUE` (`uint` i)

Returns the element in the list identified by the parameter. The parameter is a 0-based index in to the list. The result is a string. If the specified index is greater than the number of components then a zero length string is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*NAME_VALUE` (text_t name)

Operate as Text on the name-value component in the list. The name-value component is specified by the argument by providing the name whose name-value is needed. The first component that matches the name is selected. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` text_t

`*NAME_VALUE` (text_t name, `uint` i)

Operate as Text on the name-value component in the list. The name-value component is specified by the argument by providing the name whose name-value is needed. In a name-value list the same name can be repeated multiple times. The Index argument controls which occurence of the matching name-value component should be selected. The Index is 0-based. If the Index is too big then the Text object that is produced will have zero length. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

i- Index

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too

long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +
```

```
"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </

RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*REPLACE_ALL_VALUES` (text_t value)

Replaces all the values in each name-value pair with the specified string argument. For example, given argument string "?" the list 'a=b,c=d,e=f' will result in the name-value list 'a=?,c=?,e=?'. Quotes will be stripped from the values being replaced. Empty values will be replaced with the value provided. Empty elements will be preserved.

`Parameters` (expressions not allowed) `:`

value- value to replace existing values

`Returns:` nvlist_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_cache_control_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character

using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_cache_control_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t

or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides

operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a

number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL

and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert http_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUES`

Extracts a list of only the values from the name-value pair list. For example the list 'a=b,c=d,e=f' will result in the list 'b,d,f'. Note that lists do not honor the quote characters, so any nvlist_at entry that

has quotes and a quoted entry includes a separator will be split at that embedded separator. Quote characters will not be stripped from the values. Empty elements and empty values will be ignored.

`Returns:` list_t

`*VALUE` (`uint` i)

Operate as Text on the value component of the specified name-value component in the list. The index of the name-value component given by the argument is 0-based. If the specified index is greater than the number of components then a zero length Text object is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*VALUE` (text_t name)

Operate as Text on the value component of the specified name-value component in the list. The name-value component is specified by the argument by providing the name whose value is needed. The first component that matches the name is selected. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` text_t

`*VALUE` (text_t name, `uint` i)

Operate as Text on the value component of the specified name-value component in the list. The name-value component is specified by the argument by providing the name whose value is needed. In a name-value list the same name can be repeated multiple times. The Index argument controls which occurence of the matching name-value component should be selected. The Index is 0-based. If the Index is too big then the Text object that is produced will have zero length. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

i- Index

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }
```

```
    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

HTTP_CONTENT_LENGTH_T

The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from http_header_t num_at

- `TYPECAST_HTTP_HEADER_T`

  Convert http_content_length_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : Typecast an HTTP Header object of a specific type to HTTP Header.For example: HTTP.REQ.CONTENT_LENGTH.TYPECAST_HTTP_HEADER_T)

`Returns:` http_header_t

`*TYPECAST_NUM_AT`

Convert http_content_length_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". HTTP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". HTTP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / HTTP/1.1\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An HTTP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed)`:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed)`:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"
```

```
    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An HTTP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in HTTP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of

SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/

IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/ Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/ tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/ 5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </ RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/

7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_content_length_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\

\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_content_length_t

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character

has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE` (`uint` lineno)

An HTTP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }
```

```
    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

HTTP_COOKIE_T

This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from http_header_t nvlist_at

- `TYPECAST_HTTP_HEADER_T`

  Convert http_cookie_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : Typecast an HTTP Header object of a specific type to HTTP Header.For example: HTTP.REQ.CONTENT_LENGTH.TYPECAST_HTTP_HEADER_T)

`Returns:` http_header_t

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". HTTP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". HTTP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / HTTP/1.1\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

Return a Number Value giving the number of name-value components in the list. If the last Name-Value List component is of zero length or is all spaces then it is ignored.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="
```

```
    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An HTTP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in HTTP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NAMES`

Extracts a list of only the names from the name-value pair list. For example the list 'a=b,c="d=e,f",g=h' will result in the list 'a,c,g'. Empty elements will be ignored.

`Returns:` list_t

`*NAME` (`uint` i)

Operate as Text on the name component of the specified name-value component in the list. The index of the name-value component given by the argument is 0-based. If the specified index is greater than the number of components then a zero length Text object is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*NAME_VALUE` (`uint` i)

Returns the element in the list identified by the parameter. The parameter is a 0-based index in to the list. The result is a string. If the specified index is greater than the number of components then a zero length string is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*NAME_VALUE` (text_t name)

Operate as Text on the name-value component in the list. The name-value component is specified by the argument by providing the name whose name-value is needed. The first component that matches the name is selected. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` text_t

`*NAME_VALUE` (text_t name, `uint` i)

Operate as Text on the name-value component in the list. The name-value component is specified by the argument by providing the name whose name-value is needed. In a name-value list the same name can be repeated multiple times. The Index argument controls which occurence of the matching name-value component should be selected. The Index is 0-based. If the Index is too big then the Text object that is produced will have zero length. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

i- Index

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too

long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular

expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*REPLACE_ALL_VALUES` (text_t value)

Replaces all the values in each name-value pair with the specified string argument. For example, given argument string "?" the list 'a=b,c=d,e=f' will result in the name-value list 'a=?,c=?,e=?'. Quotes will be stripped from the values being replaced. Empty values will be replaced with the value provided. Empty elements will be preserved.

`Parameters` (expressions not allowed) `:`

value- value to replace existing values

`Returns:` nvlist_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_cookie_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus

character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_cookie_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes.

The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a

URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert http_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one

or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUES`

Extracts a list of only the values from the name-value pair list. For example the list 'a=b,c=d,e=f' will result in the list 'b,d,f'. Note that lists do not honor the quote characters, so any nvlist_at entry that has quotes and a quoted entry includes a separator will be split at that embedded separator. Quote characters will not be stripped from the values. Empty elements and empty values will be ignored.

`Returns:` list_t

`*VALUE` (`uint` i)

Operate as Text on the value component of the specified name-value component in the list. The index of the name-value component given by the argument is 0-based. If the specified index is greater than the number of components then a zero length Text object is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*VALUE` (text_t name)

Operate as Text on the value component of the specified name-value component in the list. The name-value component is specified by the argument by providing the name whose value is needed. The first component that matches the name is selected. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` text_t

`*VALUE` (text_t name, `uint` i)

Operate as Text on the value component of the specified name-value component in the list. The name-value component is specified by the argument by providing the name whose value is needed. In a name-value list the same name can be repeated multiple times. The Index argument controls which occurence of the matching name-value component should be selected. The Index is 0-based. If the Index is too big then the Text object that is produced will have zero length. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

i- Index

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard

XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

HTTP_DATE_T

The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from http_header_t time_at

- `TYPECAST_HTTP_HEADER_T`

  Convert http_date_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : Typecast an HTTP Header object of a specific type to HTTP Header.For example: HTTP.REQ.CONTENT_LENGTH.TYPECAST_HTTP_HEADER_T)

`Returns:` http_header_t

`*TYPECAST_NUM_AT`

Convert http_date_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_TIME_AT`

Convert http_date_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". HTTP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current time value.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". HTTP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (time_at time1, time_at time2)

Results in a Boolean TRUE value if the time value is between the Lower and the Upper time arguments. Both the Lower and the Upper time arguments must be fully specified.

For example - GMT 1995 Jan is fully specified. But GMT Jan or GMT 1995 20 or GMT Jan Mon_2 are not fully specified. The Upper and Lower arguments must be both GMT or both Local. The day of the week must not be present in either the Lower or the Upper argument. It is OK to specify the day of the month as the 1st, 2nd, 3rd or 4th weekday of the month (example Wed_3 is the 3rd Wednesday of the month). The Upper Time argument must be bigger than the Lower Time argument.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005. BETWEEN(GMT 2004, GMT 2006): TRUE BETWEEN(GMT 2004 Jan, GMT 2006 Nov): TRUE BETWEEN(GMT 2004 Jan, GMT 2006): TRUE BETWEEN(GMT 2005 May Sun_1, GMT 2005 May Sun_3): TRUE BETWEEN(GMT 2005 May 1, GMT May 2005 1): TRUE BETWEEN(LOCAL 2005 May 1, LOCAL May 2005 1): Answer depends on the NetScaler system's timezone.

`Parameters` (expressions not allowed) `:`

time1- Lower Time

time2- Upper Time

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at time1, time_at time2)

Returns Boolean TRUE if the time value is greater than or equal to the Lower argument and the time value is lesser than or equal to the Upper argument.

`Parameters``:`

time1- Lower GMT Time Value

time2- Upper GMT Time Value

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / HTTP/1.1\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An HTTP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DAY`

Extracts the day of the month from the current system time, and returns that value as a number from 1 through 31 representing that day.

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (time_at t)

Results in Boolean TRUE value if the time value is equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

EQ(GMT 2005): TRUE EQ(GMT 2005 Dec): FALSE EQ(Local 2005 May): TRUE or FALSE depending on the current timezone. EQ(GMT 10h): TRUE EQ(GMT 10h 30s): TRUE EQ(GMT May 10h): TRUE EQ(GMT Sun): TRUE EQ(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed)`:`

t- Time

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at t)

Results in Boolean TRUE value if the time value is equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (time_at t)

Results in Boolean TRUE value if the time value is greater than or equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

GE(GMT 2004): TRUE GE(GMT 2005 Jan): TRUE GE(Local 2005 May): TRUE or FALSE depending on the current timezone. GE(GMT 8h): TRUE GE(GMT 30m): FALSE GE(GMT May 10h): TRUE GE(GMT May 10h 0m): TRUE GE(GMT Sun): TRUE GE(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed)`:`

t- Time

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at t)

Results in Boolean TRUE value if the time value is greater than or equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (time_at t)

Results in Boolean TRUE value if the time value is greater than the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

GT(GMT 2004): TRUE GT(GMT 2005 Jan): TRUE GT(Local 2005 May): TRUE or FALSE depending on the current timezone. GT(GMT 8h): TRUE GT(GMT 30m): FALSE GT(GMT May 10h): FALSE GT(GMT May 10h 0m): TRUE GT(GMT Sun): FALSE GT(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at t)

Results in Boolean TRUE value if the time value is greater than the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HOURS`

Extracts the hour from the current system time, and returns that value as an integer from 0 to 23.

`Returns:` num_at

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

Based on RFC2396, following are considered URL safe characters:

Alpha-numeric characters: a-z, A-Z, 0-9

Hyphen and underscore: "-", "_"

Dot: "."

Exclamation mark: "!"

Tilde: "~"

Asterix: "*"

Single quote: "'"

Open and close parentheses: "(", ")"

Semi-colon: ";"

Colon: ":"

At symbol: "@"

Question mark: "?"

Equals: "="

Dollar: "$"

Percent: "%"

Ampersand: "&"

Plus: "+"

Comma: ","

Forward slash: ".html"

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An HTTP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in HTTP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (time_at t)

Results in Boolean TRUE value if the time value is lesser than or equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

LE(GMT 2006): TRUE LE(GMT 2005 Dec): TRUE LE(Local 2005 May): TRUE or FALSE depending on the current timezone. LE(GMT 8h): FALSE LE(GMT 30m): TRUE LE(GMT May 10h): TRUE LE(GMT Jun 11h): TRUE LE(GMT Wed): TRUE LE(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at t)

Results in Boolean TRUE value if the time value is less than or equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (time_at t)

Results in Boolean TRUE value if the time value is lesser than the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

LT(GMT 2006): TRUE LT(GMT 2005 Dec): TRUE LT(Local 2005 May): TRUE or FALSE depending on the current timezone. LT(GMT 8h): FALSE LT(GMT 30m): TRUE LT(GMT May 10h): FALSE LT(GMT Jun 11h): TRUE LT(GMT Wed): TRUE LT(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed)`:`

t- Time

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at t)

Results in Boolean TRUE value if the time value is less than the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MINUTES`

Extracts the minute from the current system time, and returns that value as an integer from 0 to 59.

`Returns:` num_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MONTH`

Extracts the month from the current system time, and returns that value as an integer from 1 (January) to 12 (December).

`Returns:` num_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (time_at t)

Results in Boolean TRUE value if the time value is not equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

NE(GMT 2005): FALSE NE(GMT 2005 Dec): TRUE NE(Local 2005 May): TRUE or FALSE depending on the current timezone. NE(GMT 10h): FALSE NE(GMT 10h 30s): FALSE NE(GMT May 10h): FALSE NE(GMT Sun): FALSE NE(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at t)

Results in Boolean TRUE value if the time value is not equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too

long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/ J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/ IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/ Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/ tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/ 5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </ RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular

expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*RELATIVE_BOOT`

Calculates the number of seconds to the closest previous or scheduled reboot, and returns an integer. If the closest boot time is in the past, the integer is negative; if it is in the future, the integer is positive.

`Returns:` num_at

`*RELATIVE_NOW`

Calculates the number of seconds between the current system time and the specified time, and returns an integer showing that number. If the designated time is in the past, the integer is negative; if it is in the future, the integer is positive.

`Returns:` num_at

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SECONDS`

Extracts the seconds from the current system time, and returns that value as an integer from 0 to 59.

`Returns:` num_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_date_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it

may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_date_t

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOCAL`

Convert the time to the local time zone

`Returns:` time_local_at

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t

or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides

operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a

number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Typecast the Time Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE` (`uint` lineno)

An HTTP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*WEEKDAY`

Results in a Number Value between 0 (Sunday) and 6 (Saturday) which gives the week day in the time value.

`Returns:` num_at

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

`*WITHIN` (time_at time1, time_at time2)

Results in a Boolean TRUE value if the time value lies within all the ranges defined by the Lower and Upper time arguments.

If an element of time like day or hour is left unspecified in the Lower argument then it is assumed to have the lowest value of its range. If an element is left unspecified in the Upper argument then it is assumed to have the highest value of its range. If the year is specified in one of the argument then it must be specified in the other argument as well. The ranges for different elements of time are month 1-12, day 1-31, weekday 0-6, hour 0-23, minutes 0-59 and seconds 0-59. Each element of time defines a range. For the result to be TRUE each element of time in the time value must lie in the corresponding range present in the Lower and Upper arguments.

Assume the time value is GMT 2005 May 10 10h 15m 30s. This is the second Tuesday of the month. WITHIN(GMT 2004, GMT 2006): TRUE WITHIN(GMT 2004 Jan, GMT 2006 Mar): FALSE (May doesn't fall in the Jan-Mar range.) WITHIN(GMT Feb, GMT): TRUE (May falls in the Feb-Dec range.) WITHIN(GMT Sun_1, GMT Sun_3): TRUE (2nd Tuesday lies within 1st Sunday and the 3rd Sunday.) WITHIN(GMT 2005 May 1 10h, GMT May 2005 1 17h): TRUE WITHIN(LOCAL 2005 May 1, LOCAL May 2005 1): Answer depends on the NetScaler system's timezone.

`Parameters` (expressions not allowed) `:`

time1- Lower Time

time2- Upper Time

`Returns:` bool_at

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

HTTP_HEADER_T

The HTTP.REQ.HEADER("header name") or HTTP.RES.HEADER("header name") object represents the multiple lines of a particular HTTP header type. This object is also a Text object. Direct Text operations on this object will mostly operate only on the value in the last header line of this type. Some Text operations like CONTAINS have been overridden to operate on values in all the header lines of this type.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

`AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". HTTP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". HTTP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / HTTP/1.1\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An HTTP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Patset Name

`Returns:` num_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*INSTANCE` (`uint` lineno)

An HTTP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in HTTP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter

matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*TYPECAST_TEXT_T`

Convert http_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*VALUE` (`uint` lineno)

An HTTP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data

from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of

SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/

IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/ Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/ tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/ 5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </ RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/

7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_header_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH

denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_header_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

HTTP_HOSTNAME_T

This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `DOMAIN`

  Operate as Text on the Domain name part of the hostname. If the hostname is www.foobar.com or www.foobar.com:8080, then domain is foobar.com. This operation will return incorrect results if the hostname has an IP address. This method also sets the text mode to case-insensitive. So all text operations after this method will operate in a case-insensitive manner.

`Returns:` text_t

`*EQ` (text_t hostname)

Operates on the text contents of hostname. Results in Boolean TRUE value if the hostname matches the input argument. The comparison will be case-insensitive and if textmode is URLENCODED the hostname will be decoded before comparison. If hostname is www.foobar.com or www.foobar.com., then EQ(www.foobar.com) returns TRUE.

`Parameters``:`

hostname- Hostname

`Returns:` bool_at

`*PORT`

Operate as Number on the port part of the hostname. The string following and including the first : is considered the port value. Examples:

If the hostname is www.foo.com:8080 then the port is ":8080". If the hostname is www.foo.com: then the port is ":". If the hostname is www.foo.com then the port is "" and points to just after ".com".

When the numerical value in the port is missing then it assumes a default value of 80 or 443 (for HTTPS connections).

`Returns:` num_t

`*SERVER`

Operate as Text on the Server name part of the hostname. If the hostname is www.foobar.com or www.foobar.com:8080, then server is www.foobar.com. This method also sets the text mode to case-insensitive. So all text operations after this method will operate in a case-insensitive manner.

`Returns:` text_t

`*TYPECAST_TEXT_T`

Convert http_hostname_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings

longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This

function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"
```

```
    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'

- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>

<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </
RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_hostname_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_hostname_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given

format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', '"') handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

HTTP_METHOD_E

This object represents one of the HTTP Request Methods.

Enumerations

GET

POST

HEAD

PUT

DELETE

OPTIONS

TRACE

CONNECT

UNKNOWN_METHOD

This topic lists the expressions that are provided by this class.

`EQ` (http_method_e m)

The result is Boolean TRUE if the input argument is equal to the HTTP Request Method represented by this object.

`Parameters` (expressions not allowed) `:`

m- Http Request Method Name

`Returns:` bool_at

HTTP_METHOD_T

This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t http_method_e

- `TYPECAST_TEXT_T`

  Convert http_method_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings

longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (http_method_e m)

The result is Boolean TRUE if the input argument is equal to the HTTP Request Method represented by this object.

`Parameters` (expressions not allowed) `:`

m- Http Request Method Name

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"
```

```
    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XXDP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AUnw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed)`:`

charset- Character Set

`Returns:` http_method_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_method_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has

same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code

258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the

current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses,

A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL

and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example:

HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

HTTP_PROTOCOL_T

Models the HTTP message types.

This topic lists the expressions that are provided by this class.

- `REQ`

  Operates on HTTP Request.

`Returns:` http_req_t

- `RES`

  Operates on HTTP Response.

`Returns:` http_res_t

HTTP_REQ_T

Operates on HTTP Request.

This topic lists the expressions that are provided by this class.

`BODY` (`uint` i)

Operate as Text on the HTTP response body. The length of the body is equal to the number in the argument. If there aren't enough characters in the body then the entire body is selected.

`Parameters``:`

i- Body length

`Returns:` text_t

- `CACHE_CONTROL`

  Returns the HTTP Cache-Control object.

`Returns:` http_cache_control_t

- `CONTENT_LENGTH`

  Returns the length of the HTTP request as a number.

`Returns:` http_content_length_t

- `COOKIE`

  (Name/Value List) Returns the contents of the HTTP Cookie header as a name/value list.

`Returns:` http_cookie_t

- `CS_VSERVER`

  Returns the CS vserver serving the current request.

`Returns:` vserver_t

- `DATE`

Returns the contents of the HTTP Date header as text or as a date object.The date formats recognized are: RFC822. Sun, 06 Jan 1980 08:49:37 GMT RFC850. Sunday, 06-Jan-80 9:49:37 GMT ASCTIME. Sun Jan 6 08:49:37 1980

`Returns:` http_date_t

- `FULL_HEADER`

  Returns the entire request header (including the terminating \\r\\n\\r\\n)

`Returns:` text_t

`HEADER` (text_t header_name)

Returns the contents of the HTTP header specified by the String argument. The header name cannot be longer than 32 characters.

`Parameters` (expressions not allowed)`:`

header_name- Header Name

`Returns:` http_header_t

- `HOSTNAME`

  Obtain the HTTP Host Name object from this request. If the target hostname is present in the first line of the request then that is selected. Otherwise the value in the last occurrence of the HOST header is selected. Sets the text mode to case insensitive.

`Returns:` http_hostname_t

- `IS_NTLM_OR_NEGOTIATE`

  Returns TRUE if request is part of NTLM or NEGOTIATE connection

`Returns:` bool_at

- `IS_VALID`

  Returns TRUE if the HTTP request is properly formed.

`Returns:` bool_at

- `LB_VSERVER`

  Returns the LB vserver serving the current request.

`Returns:` vserver_t

- `METHOD`

  Returns the HTTP method.

`Returns:` http_method_t

- `TRACKING`

  Returns the HTTP body tracking mechanism.

`Returns:` http_tracking_e

- `TXID`

  Returns the HTTP Transaction ID. The value is a function of an internal transaction number, system boot time and system mac address. HTTP.REQ.TXID is same as HTTP.RES.TXID.

`Returns:` text_t

- `URL`

  Obtain the HTTP URL object from the request. The Text object backing the HTTP URL object has the Text Mode set to URLENCODED by default.

`Returns:` http_url_t

- `USER`

  Returns the AAA User associated with the current HTTP transaction.

`Returns:` aaa_user_t

- `VERSION`

  Returns the HTTP version.

`Returns:` http_version_t

HTTP_RES_T

Operates HTTP Response.

This topic lists the expressions that are provided by this class.

`BODY` (`uint` i)

Operate as Text on the HTTP response body. The length of the body is equal to the number in the argument. If there aren't enough characters in the body then the entire body is selected.

`Parameters``:`

i- Body length

`Returns:` text_t

- `CACHE_CONTROL`

  Returns the HTTP Cache-Control object

`Returns:` http_cache_control_t

- `CONTENT_LENGTH`

  Returns the length of the HTTP response as a number.

`Returns:` http_content_length_t

- `DATE`

  Returns the contents of the HTTP Date header as text or as a date object.The date formats recognized are: RFC822. Sun, 06 Jan 1980 08:49:37 GMT RFC850. Sunday, 06-Jan-80 9:49:37 GMT ASCTIME. Sun Jan 6 08:49:37 1980

`Returns:` http_date_t

- `FULL_HEADER`

  Returns the entire response header (including the terminating \\r\\n\\r\\n)

`Returns:` text_t

`HEADER` (text_t header_name)

Returns the contents of the HTTP headerspecified by the String argument. The header name cannot be longer than 32 characters.

`Parameters` (expressions not allowed) `:`

header_name- Header Name

`Returns:` http_header_t

- `IS_CLIENT_ERROR`

  Returns True if response code is 4xx.

`Returns:` bool_at

- `IS_INFORMATIONAL`

  Returns True if response code is 1xx.

`Returns:` bool_at

- `IS_REDIRECT`

  Returns True if response code is 3xx.

`Returns:` bool_at

- `IS_SERVER_ERROR`

  Returns True if response code is 5xx.

`Returns:` bool_at

- `IS_SUCCESSFUL`

  Returns True if response code is 2xx.

`Returns:` bool_at

- `IS_VALID`

  Returns TRUE if the HTTP request is properly formed.

`Returns:` bool_at

- `MEDIA`

  Designates an expression that refers to media analytics

`Returns:` media_t

- `SET_COOKIE`

  Obtain the HTTP Set-Cookie Header Object from this response.

`Returns:` http_set_cookie_t

- `SET_COOKIE2`

  Obtain the HTTP Set-Cookie2 Header Object from this response.

`Returns:` http_set_cookie_t

- `STATUS`

  Returns the HTTP response status code.

`Returns:` num_t

- `STATUS_MSG`

  Returns the HTTP response status message.

`Returns:` text_t

- `TRACKING`

  Returns the HTTP body tracking mechanism.

`Returns:` http_tracking_e

- `TXID`

  Returns the HTTP Transaction ID. The value is a function of an internal transaction number, system boot time and system mac address. HTTP.REQ.TXID is same as HTTP.RES.TXID.

`Returns:` text_t

- `VERSION`

Returns the HTTP version.

`Returns:` http_version_t

HTTP_SET_COOKIE_T

HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from http_header_t

`COOKIE` (text_t name)

Returns the Cookie with Cookie_name if present else NULL (Text of length 0 pointing nowhere) is returned. The name comparison is case insensitive. Raises UNDEF if more than 15 Set-Cookie headers are present and the Cookie could not be found in the first 15 headers.

`Parameters` (expressions not allowed) `:`

name- Cookie_Name

`Returns:` cookie_t

`*COOKIE` (text_t name, `uint` i)

Returns the i-th instance of Cookie with name if present else NULL (Text with length 0 pointing nowhere) is returned. The index of the Cookie component given by the argument is 0-based. The name comparison is case insensitive. Raises UNDEF if more than 15 Set-Cookie headers are present and the Cookie could not be found in the first 15 headers.

`Parameters` (expressions not allowed) `:`

name- Cookie_Name

i- Index

`Returns:` cookie_t

`*EXISTS` (text_t name)

Returns TRUE if the Cookie with name exists in the Set-Cookie header else FALSE. The name comparison is case insensitive. Raises UNDEF if more than 15 Set-Cookie headers are present and the Cookie could not be found in the first 15 headers.

`Parameters` (expressions not allowed) `:`

name- Cookie_Name

`Returns:` bool_at

`*TYPECAST_HTTP_HEADER_T`

Convert http_set_cookie_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : Typecast an HTTP Header object of a specific type to HTTP Header.For example: HTTP.REQ.CONTENT_LENGTH.TYPECAST_HTTP_HEADER_T)

`Returns:` http_header_t

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". HTTP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". HTTP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / HTTP/1.1\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: HTTP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
HTTP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An HTTP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An HTTP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in HTTP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'

- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +
```

```
"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB

- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_set_cookie_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out

after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_set_cookie_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

HTTP/1.1 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes.

The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a

URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert http_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one

or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE` (`uint` lineno)

An HTTP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

HTTP/1.1 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: HTTP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;

- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>
```

```
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
```

```
            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>
```

```
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
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    &lt;/Val>
&lt;/Books>
```

HTTP_TRACKING_E

Provides the tracking type of the HTTP Request or Response. (Length, Fin, Chunk)

Enumerations

LENGTH

FIN

CHUNK

UNKNOWN_TRACKING

This topic lists the expressions that are provided by this class.

`EQ` (http_tracking_e t)

The result is Boolean TRUE if the tracking type of the HTTP request or response matches the input argument.

`Parameters` (expressions not allowed) `:`

t- Http Tracking Mechanism

`Returns:` bool_at

HTTP_URL_T

HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

`APPEND_QUERY_PARAMETER` (text_t name, text_t value)

Returns the URL string with a query parameter appended. This function appends query parameter after Converting URL unsafe characters into corresponding '%xx' values and retains the rest.

`Parameters` (expressions not allowed) `:`

name- query parameter name

value- query parameter value

`Returns:` http_url_t

`*HOSTNAME`

Operate as HTTP Host Name on the hostname present in the URL. Sets the text mode to case insensitive. It can not be used in HTTP response processing contexts.

`Returns:` http_hostname_t

`*PATH`

Operate as a / separated List on the path component of the URL. For example: If the URL is http://www.foo.com/a/b/c/bar.html?a=1 then operation will select /a/b/c/bar.html. HTTP.REQ.URL.PATH.GET(1) in the above example will select "a".

`Returns:` list_t

`*PATH_AND_QUERY`

Operate as Text on the portion of the URL following the hostname. For example: If the URL is http://www.foo.com/a/b/c/bar.html?a=1 then it will return /a/b/c/bar.html?a=1.

`Returns:` text_t

`*PROTOCOL`

Operate as Text on the protocol present in the URL. It can not be used in HTTP response processing contexts.

`Returns:` text_t

`*QUERY`

Operate as a Name-Value List (with delimiters = and &) on the query component of the URL.

`Returns:` nvlist_t

`*STRIP_SUFFIX`

Returns the URL with its suffix stripped. For Example: If the HTTP Request URL is /testsite/file5.html then it will return /testsite/file5 as output. If the HTTP Request URL is /testsite/file5 then it will return /testsite/file5 as output.

`Returns:` text_t

`*SUFFIX`

Operate as Text on the filename suffix present in the filename component of the URL. For example: If the PATH is /a/b/c/foo.bar.html then this operation will select md.

`Returns:` text_t

`*TYPECAST_TEXT_T`

Convert http_url_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the

regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"
```

```
    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +
```

```
"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_url_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\

\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_url_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

HTTP_VERSION_T

HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `MAJOR`

  Operate as Number on the major component of the HTTP Version string.

`Returns:` num_t

`*MINOR`

Operate as Number on the minor component of the HTTP Version string.

`Returns:` num_t

`*TYPECAST_TEXT_T`

Convert http_version_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED,

NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"
```

```
    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +
```

```
"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` http_version_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\

\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` http_version_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

ICA_PROTOCOL_T

Models the ICA protocol.

This topic lists the expressions that are provided by this class.

- `SERVER`

  Operates on the ICA protocol data associated with the current packet.

`Returns:` ica_server_t

ICA_SERVER_T

Operates on the ICA flow.

This topic lists the expressions that are provided by this class.

- `IP`

  Returns the IP of the backend server.

`Returns:` ip_address_at

- `IPV6`

  Returns IPv6 Address of the backend server.

`Returns:` ipv6_address_at

- `PORT`

  Returns the destination port.

`Returns:` num_at

ICAP_PROTOCOL_T

Models the ICAP message types.

This topic lists the expressions that are provided by this class.

- `RES`

  Operates on ICAP Response.

`Returns:` icap_res_t

ICAP_RES_T

Operates on ICAP Response.

This topic lists the expressions that are provided by this class.

- `DATE`

  Returns the contents of the ICAP Date header as text or as a date object. The date formats recognized are: RFC822. Sun, 06 Jan 1980 08:49:37 GMT RFC850. Sunday, 06-Jan-80 9:49:37 GMT ASCTIME. Sun Jan 6 08:49:37 1980

`Returns:` http_date_t

- `FULL_HEADER`

  Returns the entire ICAP response header (including the terminating \\r\\n\\r\\n)

`Returns:` text_t

`HEADER` (text_t header_name)

Returns the contents of the ICAP header specified by the String argument. The header name cannot be longer than 32 characters.

`Parameters` (expressions not allowed) `:`

header_name- Header Name

`Returns:` http_header_t

- `IS_CLIENT_ERROR`

  Returns True if response code is 4xx.

`Returns:` bool_at

- `IS_SERVER_ERROR`

  Returns True if response code is 5xx.

`Returns:` bool_at

- `IS_SUCCESSFUL`

  Returns True if response code is 2xx.

`Returns:` bool_at

- `SET_COOKIE`

  Obtain the ICAP Set-Cookie Header Object from this response.

`Returns:` http_set_cookie_t

- `STATUS`

  Returns the ICAP response status code.

`Returns:` num_t

- `STATUS_MSG`

  Returns the ICAP response status message.

`Returns:` text_t

- `VERSION`

  Returns the ICAP version.

`Returns:` http_version_t

INTERFACE_REQ_T

The physical interface request

This topic lists the expressions that are provided by this class.

- `ID`

  Extracts the interface ID of the interface through which the current packet entered the Application Switch, and returns that ID.

`Returns:` interface_t

- `RXTHROUGHPUT`

  Returns an integer representing the raw received traffic throughput in kilobytes per second for the previous seven seconds.

`Returns:` num_at

- `RXTXTHROUGHPUT`

  Returns an integer representing the raw received and transmitted traffic throughput in kilobytes per second for the previous seven seconds.

`Returns:` num_at

- `TXTHROUGHPUT`

  Returns an integer representing the raw transmitted traffic throughput in kilobytes per second for the previous seven seconds.

`Returns:` num_at

INTERFACE_RES_T

The physical interface response

This topic lists the expressions that are provided by this class.

- `ID`

  Extracts the interface ID of the interface through which the current packet entered the Application Switch, and returns that ID.

`Returns:` interface_t

- `RXTHROUGHPUT`

  Returns an integer representing the raw received traffic throughput in kilobytes per second for the previous seven seconds.

`Returns:` num_at

- `RXTXTHROUGHPUT`

  Returns an integer representing the raw received and transmitted traffic throughput in kilobytes per second for the previous seven seconds.

`Returns:` num_at

- `TXTHROUGHPUT`

  Returns an integer representing the raw transmitted traffic throughput in kilobytes per second for the previous seven seconds.

`Returns:` num_at

INTERFACE_T

Network Interface ID

This topic lists the expressions that are provided by this class.

`EQ` (text_t id)

Returns Boolean TRUE if the interface's ID matches the argument. The input string cannot be bigger than 9 characters. If Cluster is enabled then it will support 3-tuple interface ID too \[Local-node,controller,unit\]. Examples: CLIENT.INTERFACE.ID.EQ("1/1") SERVER.INTERFACE.ID.EQ("LA/1") CLIENT.INTERFACE.ID.EQ("0/1/1") SERVER.INTERFACE.ID.EQ("1/LA/1") CONNECTION.INTF.EQ("1/1")

`Parameters` (expressions not allowed) `:`

id- Interface ID

`Returns:` bool_at

`NE` (text_t id)

Returns Boolean TRUE if the interface's ID doesn't match the argument. The input string cannot be bigger than 9 characters. If Cluster is enabled then it will support 3-tuple interface ID too \[Local-node,controller,unit\]. Examples: CLIENT.INTERFACE.ID.NE("1/1") SERVER.INTERFACE.ID.NE("LA/1") CLIENT.INTERFACE.ID.NE("0/1/1") SERVER.INTERFACE.ID.NE("1/LA/1") CONNECTION.INTF.NE("LO/1")

`Parameters` (expressions not allowed) `:`

id- Interface ID

`Returns:` bool_at

IP_ADDRESS_AT

Provides operations for the 32-bit integral IP address value.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from num_at

`APPEND` (text_t str)

Appends the given string to the string representation of the current IP address.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPLY_MASK` (ip_address_at i)

Returns IP Address Value after applying subnet mask which can take values between 0.0.0.0 and 255.255.255.255.

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` ip_address_at

`*APPLY_MASK` (num_at mask)

Returns IP Address Value after applying subnet mask which can take values between 0 and 0xffffffffUL.

`Parameters` (expressions not allowed) `:`

mask- Subnet Mask

`Returns:` ip_address_at

`*APPLY_MASK` (time_local_at mask)

Returns IP Address Value after applying subnet mask which can take values between 0 and 0xffffffffUL.

`Parameters` (expressions not allowed) `:`

mask- Subnet Mask

`Returns:` ip_address_at

`*APPLY_MASK` (time_at mask)

Returns IP Address Value after applying subnet mask which can take values between 0 and 0xffffffffUL.

`Parameters` (expressions not allowed) `:`

mask- Subnet Mask

`Returns:` ip_address_at

`*APPLY_MASK` (unsigned_long_at mask)

Returns IP Address Value after applying subnet mask which can take values between 0 and 0xffffffffUL.

`Parameters` (expressions not allowed) `:`

mask- Subnet Mask

`Returns:` ip_address_at

`*CLOUD_SERVICE_PROVIDER` (ip_protocol_cloud_service_provider_e service_provider)

Cloud IP. Returns TRUE if the client IP is categorized as cloud IP and cloud service provider matches service provider argument. else returns FALSE.

`Parameters` (expressions not allowed) `:`

service_provider- is service provider

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the IP address value is same as the argument. For example: CLIENT.IP.DST.EQ(10.100.10.100)

`Parameters``:`

i- IP Address

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GET1`

Returns a Number Value 10 if the IP address value is 10.100.200.1

`Returns:` num_at

`*GET2`

Returns a Number Value 100 if the IP address value is 10.100.200.1

`Returns:` num_at

`*GET3`

Returns a Number Value 200 if the IP address value is 10.100.200.1

`Returns:` num_at

`*GET4`

Returns a Number Value 1 if the IP address value is 10.100.200.1

`Returns:` num_at

`*IN_SUBNET` (`ip_subnet` s)

Returns Boolean TRUE if the IP address value is in the subnet specified by the argument. For example: CLIENT.IP.DST.IN_SUBNET(10.100.10.100/18)

`Parameters` (expressions not allowed) `:`

s- IP Subnet

`Returns:` bool_at

`*IPREP_IS_MALICIOUS`

IP Reputation. Returns TRUE if the client IP is categorized as malicious else returns FALSE.

`Returns:` bool_at

`*IPREP_THREAT_CATEGORY` (ip_protocol_iprep_category_e category)

IP Reputation. Returns TRUE if the client IP is categorized as malicious and threat category matches category argument, else returns FALSE.

`Parameters` (expressions not allowed) `:`

category- is IP category

`Returns:` bool_at

`*IS_CLOUD_IP`

Cloud IP. Returns TRUE if the client IP is categorized as cloud service provide IP. else returns FALSE.

`Returns:` bool_at

`*IS_IPV6`

Returns TRUE or FALSE depending on whether this is an IPv6 client.

`Returns:` bool_at

`*LAT_LONG`

Results in text_t containing location as cordinates. Location will be of the form: Latitude,Longitude Expression example: CLIENT.IP.SRC.LAT_LONG For example: 36,-119

`Returns:` text_t

`*LOCATION`

Results in list_t containing location. Location will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IP.SRC.LOCATION For example: NorthAmerica.US.*.*.*.*

`Returns:` list_t

`*LOCATION` (num_at n)

Results in list_t containing location. Location will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IP.SRC.LOCATION(2) For example: NorthAmerica.US

`Parameters` (expressions not allowed) `:`

n- is the level up to which location will be returned, the first qualifier is numbered 1.

`Returns:` list_t

`*MATCHES_LOCATION` (text_t location)

Results in Boolean TRUE value if the location of the IP matches the location argument. Location string can be of the form: qual1.qual2.qual3.qual4.qual5.qual6 For example: NorthAmerica.CA.*

`Parameters` (expressions not allowed) `:`

location- Location

`Returns:` bool_at

`*MATCHES` (text_t hostname)

Returns Boolean TRUE if hostname IP address matches the current IP address. The hostname string cannot be bigger than 255 characters.

`Parameters` (expressions not allowed) `:`

hostname- HostName

`Returns:` bool_at

`*SUBNET` (num_at n)

Returns IP Address Value after applying the subnet which can take values between 0 and 32. For Example: CLIENT.IP.SRC.SUBNET(24) will give 192.168.1.0 for 192.168.1.\[0-255\]

`Parameters` (expressions not allowed) `:`

n- Subnet Value

`Returns:` ip_address_at

`*TYPECAST_IPV6_ADDRESS_AT`

Typecast IPv4 address to its "IPv4-mapped IPv6 address" representation.

`Returns:` ipv6_address_at

`*TYPECAST_NUM_AT`

Convert ip_address_at to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_TEXT_T`

Typecast the IP Address Value to its string representation.

`Returns:` text_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the IPv4 address value to an Unsigned Long value.

`Returns:` unsigned_long_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

IP_ADDRESS_PAIR_T

Provides operations for IP address pair. Takes pair of port (src,dest) as input.

This topic lists the expressions that are provided by this class.

`EQ` (ip_address_at i)

Returns Boolean TRUE if either source IP or Destination IP is same as the argument. Example : CONNECTION.IP.EQ(127.0.0.1)

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` bool_at

`NE` (ip_address_at i)

Returns Boolean TRUE if neither source IP nor Destination IP is same as the argument. Example : CONNECTION.IP.NE(127.0.0.1)

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` bool_at

IP_ADDRESS_T

Represents an IP address present in the 10.100.200.1 format.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t ip_address_at

- `TYPECAST_IP_ADDRESS_AT`

  Convert ip_address_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_NUM_AT`

Convert ip_address_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert ip_address_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current IP address.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPLY_MASK` (ip_address_at i)

Returns IP Address Value after applying subnet mask which can take values between 0.0.0.0 and 255.255.255.255.

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` ip_address_at

`*APPLY_MASK` (num_at mask)

Returns IP Address Value after applying subnet mask which can take values between 0 and 0xffffffffUL.

`Parameters` (expressions not allowed) `:`

mask- Subnet Mask

`Returns:` ip_address_at

`*APPLY_MASK` (time_local_at mask)

Returns IP Address Value after applying subnet mask which can take values between 0 and 0xffffffffUL.

`Parameters` (expressions not allowed) `:`

mask- Subnet Mask

`Returns:` ip_address_at

`*APPLY_MASK` (time_at mask)

Returns IP Address Value after applying subnet mask which can take values between 0 and 0xffffffffUL.

`Parameters` (expressions not allowed) `:`

mask- Subnet Mask

`Returns:` ip_address_at

`*APPLY_MASK` (unsigned_long_at mask)

Returns IP Address Value after applying subnet mask which can take values between 0 and 0xffffffffUL.

`Parameters` (expressions not allowed) `:`

mask- Subnet Mask

`Returns:` ip_address_at

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*CLOUD_SERVICE_PROVIDER` (ip_protocol_cloud_service_provider_e service_provider)

Cloud IP. Returns TRUE if the client IP is categorized as cloud IP and cloud service provider matches service provider argument. else returns FALSE.

`Parameters` (expressions not allowed)`:`

service_provider- is service provider

`Returns:` bool_at

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object

is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the IP address value is same as the argument. For example: CLIENT.IP.DST.EQ(10.100.10.100)

`Parameters``:`

i- IP Address

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GET1`

Returns a Number Value 10 if the IP address value is 10.100.200.1

`Returns:` num_at

`*GET2`

Returns a Number Value 100 if the IP address value is 10.100.200.1

`Returns:` num_at

`*GET3`

Returns a Number Value 200 if the IP address value is 10.100.200.1

`Returns:` num_at

`*GET4`

Returns a Number Value 1 if the IP address value is 10.100.200.1

`Returns:` num_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"
```

```
    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IN_SUBNET` (`ip_subnet` s)

Returns Boolean TRUE if the IP address value is in the subnet specified by the argument. For example: CLIENT.IP.DST.IN_SUBNET(10.100.10.100/18)

`Parameters` (expressions not allowed) `:`

s- IP Subnet

`Returns:` bool_at

`*IPREP_IS_MALICIOUS`

IP Reputation. Returns TRUE if the client IP is categorized as malicious else returns FALSE.

`Returns:` bool_at

`*IPREP_THREAT_CATEGORY` (ip_protocol_iprep_category_e category)

IP Reputation. Returns TRUE if the client IP is categorized as malicious and threat category matches category argument, else returns FALSE.

`Parameters` (expressions not allowed) `:`

category- is IP category

`Returns:` bool_at

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_CLOUD_IP`

Cloud IP. Returns TRUE if the client IP is categorized as cloud service provide IP. else returns FALSE.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6`

Returns TRUE or FALSE depending on whether this is an IPv6 client.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LAT_LONG`

Results in text_t containing location as cordinates. Location will be of the form: Latitude,Longitude Expression example: CLIENT.IP.SRC.LAT_LONG For example: 36,-119

`Returns:` text_t

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LOCATION`

Results in list_t containing location. Location will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IP.SRC.LOCATION For example: NorthAmerica.US.*.*.*.*

`Returns:` list_t

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LOCATION` (num_at n)

Results in list_t containing location. Location will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IP.SRC.LOCATION(2) For example: NorthAmerica.US

`Parameters` (expressions not allowed) `:`

n- is the level up to which location will be returned, the first qualifier is numbered 1.

`Returns:` list_t

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MATCHES_LOCATION` (text_t location)

Results in Boolean TRUE value if the location of the IP matches the location argument. Location string can be of the form: qual1.qual2.qual3.qual4.qual5.qual6 For example: NorthAmerica.CA.*

`Parameters` (expressions not allowed) `:`

location- Location

`Returns:` bool_at

`*MATCHES` (text_t hostname)

Returns Boolean TRUE if hostname IP address matches the current IP address. The hostname string cannot be bigger than 255 characters.

`Parameters` (expressions not allowed) `:`

hostname- HostName

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` ip_address_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a

result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` ip_address_t

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBNET` (num_at n)

Returns IP Address Value after applying the subnet which can take values between 0 and 32. For Example: CLIENT.IP.SRC.SUBNET(24) will give 192.168.1.0 for 192.168.1.\[0-255\]

`Parameters` (expressions not allowed) `:`

n- Subnet Value

`Returns:` ip_address_at

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t

or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides

operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Typecast IPv4 address to its "IPv4-mapped IPv6 address" representation.

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-

value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP

Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the IPv4 address value to an Unsigned Long value.

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

IP_OPTIONS_T

IP protocol options

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `COUNT`

  Returns the number of IP options present.

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert ip_options_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPE` (`uint` type)

Returns the entire IP option including the option type and option length as sequence of bytes whose type is specified as an argument. This can be used to access the option fields individually.

`Parameters` (expressions not allowed) `:`

type- Type value

`Returns:` ip_options_type_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"
```

```
    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +
```

```
"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` ip_options_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\

\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` ip_options_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

IP_OPTIONS_TYPE_T

IP Options Type

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `EXISTS`

  Returns TRUE if an instance of the current IP option type exists.

`Returns:` bool_at

`*OPTION_LENGTH`

Returns length of the current IP option type in bytes This is the total length of the IP option that got inserted in the IP header. This includes the length of the type byte and the length of the size byte if it exists.

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert ip_options_type_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*VALUE`

Returns the value of the current IP option as a sequence of bytes.

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the

regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"
```

```
    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +
```

```
"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` ip_options_type_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\

\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` ip_options_type_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

IP_PROTOCOL_CLOUD_SERVICE_PROVIDE

This object represents cloud service provider name.

Enumerations

CLOUD_AWS

CLOUD_GCP

CLOUD_AZURE

CLOUD_ORACLE

CLOUD_IBM

CLOUD_SALESFORCE

IP_PROTOCOL_IPREP_CATEGORY_E

This object represents threat category.

Enumerations

SPAM_SOURCES

WINDOWS_EXPLOITS

WEB_ATTACKS

BOTNETS

SCANNERS

DOS

REPUTATION

PHISHING

PROXY

NETWORK

CLOUD_PROVIDERS

MOBILE_THREATS

TOR_PROXY

IP_PROTOCOL_TYPE_E

This object represents one of the IP Protocols.

Enumerations

TCP

UDP

ICMP

AH

ESP

GRE

VRRP

OSPFIGP

IPIP

ICMPV6

OSPFPREF

FRAGMENT

PROTOCOL_UNKNOWN

This topic lists the expressions that are provided by this class.

`EQ` (ip_protocol_type_e protocol)

The result is Boolean TRUE if the input argument is equal to the Protocol represented by this object.

`Parameters` (expressions not allowed) `:`

protocol- Protocol Type

`Returns:` bool_at

IP_PROTOCOL_TYPE_T

This object provides Text operations and Protocol Enum operations on the Request Protocol.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from ip_protocol_type_e num_at

- `TYPECAST_NUM_AT`

  Convert ip_protocol_type_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (ip_protocol_type_e protocol)

The result is Boolean TRUE if the input argument is equal to the Protocol represented by this object.

`Parameters` (expressions not allowed) `:`

protocol- Protocol Type

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

IP_REQ_PROTOCOL_T

IP Protocol Request.

This topic lists the expressions that are provided by this class.

- `DST`

  Returns the destination IP of the current packet.

`Returns:` ip_address_at

- `HEADER_CHECKSUM`

  Returns the Header Checksum of the current IP Packet.

`Returns:` num_at

- `HEADER_LENGTH`

  Returns the Header length of the current IP Packet in units of 32 bits.

`Returns:` num_at

- `IDENTIFICATION`

  Returns the current IP Packet Identification field value.

`Returns:` num_at

- `OPTIONS`

  Returns the entire set of current IP packet options as a single text chunk, which can also be used to access the options individually.

`Returns:` ip_options_t

- `PAYLOAD`

  Returns the current IP Packet Payload.

`Returns:` text_t

- `PROTOCOL`

  Returns the Protocol of the current packet.

`Returns:` ip_protocol_type_t

- `SRC`

  Returns the source IP of the current packet.

`Returns:` ip_address_at

- `TOS`

  If the current packet is IPv4, then it returns the TOS field value. If the current packet is IPv6 then it returns the Traffic Class field value.

`Returns:` ip_tos_t

- `TTL`

  If the current packet is IPv4, then it returns the TTL field value. If the current packet is IPv6 then it returns the Hop Limit field value.

`Returns:` num_at

- `VERSION`

  Returns the Version of the current IP Packet.

`Returns:` num_at

IP_RES_PROTOCOL_T

IP Protocol Response.

This topic lists the expressions that are provided by this class.

- `DST`

  Returns the destination IP of the current packet.

`Returns:` ip_address_at

- `HEADER_CHECKSUM`

  Returns the Header Checksum of the current IP Packet.

`Returns:` num_at

- `HEADER_LENGTH`

  Returns the Header length of the current IP Packet in units of 32 bits.

`Returns:` num_at

- `IDENTIFICATION`

  Returns the current IP Packet Identification field value.

`Returns:` num_at

- `OPTIONS`

  Returns the entire set of current IP packet options as a single text chunk, which can also be used to access the options individually.

`Returns:` ip_options_t

- `PAYLOAD`

  Returns the current IP Packet Payload.

`Returns:` text_t

- `PROTOCOL`

  Returns the Protocol of the current packet.

`Returns:` ip_protocol_type_t

- `SRC`

  Returns the source IP of the current packet.

`Returns:` ip_address_at

- `TOS`

  If the current packet is IPv4, then it returns the TOS field value. If the current packet is IPv6 then it returns the Traffic Class field value.

`Returns:` ip_tos_t

- `TTL`

  If the current packet is IPv4, then it returns the TTL field value. If the current packet is IPv6 then it returns the Hop Limit field value.

`Returns:` num_at

- `VERSION`

  Returns the Version of the current IP Packet.

`Returns:` num_at

IP_TOS_AT

Provides operations to TOS field in IP header.

IP_TOS_T

Provides operations to TOS field in IP header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t ip_tos_at

- `TYPECAST_NUM_AT`

  Convert ip_tos_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert ip_tos_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DSCP`

Return the DSCP field value.

`Returns:` num_at

`*ECN`

Return the ECN field value.

`Returns:` num_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"
```

```
    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` ip_tos_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a

result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` ip_tos_t

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', '"') handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for

parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

IPV6_ADDRESS_AT

Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5

This topic lists the expressions that are provided by this class.

`APPEND` (text_t str)

Appends the given string to the string representation of the current IPv6 address.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`APPLY_MASK` (ipv6_address_at i)

Returns IPV6 Address Value after applying subnet mask which can take values between 0.0.0.0.0.0.0.0 and ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` ipv6_address_at

`EQ` (ipv6_address_at i)

Returns Boolean TRUE if the IP address value is same as the argument. IPv6 Address specified in one of the valid IPv6 forms like CLIENT.IPV6.DST.EQ(1000:1001:CD10:0000:0000:89AB:4567:CDEF). All valid forms of specifying an IPv6 address are supported.

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` bool_at

- `GET1`

  If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 1000, the first set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET1.EQ(0x2058) will return true.

`Returns:` num_at

- `GET2`

  If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 1001, the second set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET2.EQ(0x2) will return true.

`Returns:` num_at

- `GET3`

  If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return CD10, the third set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET3.EQ(0x0) will return true.

`Returns:` num_at

- `GET4`

  If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 0000, the fourth set of 128 bits of the IP address. The IPv6 address is printed using

hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET4.EQ(0x0) will return true.

`Returns:` num_at

- `GET5`

  If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 0000, the fifth set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET5.EQ(0x0) will return true.

`Returns:` num_at

- `GET6`

  If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 89AB, the sixth set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET6.EQ(0x0) will return true.

`Returns:` num_at

- `GET7`

  If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 4567, the seventh set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET7.EQ(0x230) will return true.

`Returns:` num_at

- `GET8`

  If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return CDEF, the eighth set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET8.EQ(0x3a5a) will return true.

`Returns:` num_at

`IN_SUBNET` (ipv6_subnet_at s)

Returns Boolean TRUE if the IP address value is in the subnet specified by the argument. IPv6 Subnet specified in one of the valid IPv6 forms like CLIENT.IPV6.DST.EQ(1000:1001:CD10:0000:0000:89AB:4567:CDEF/60). All valid forms of specifying an IPv6 address are supported.

`Parameters` (expressions not allowed) `:`

s- IP Subnet

`Returns:` bool_at

- `IPREP_IS_MALICIOUS`

  IP Reputation. Returns TRUE if the client IP is categorized as malicious else returns FALSE.

`Returns:` bool_at

`IPREP_THREAT_CATEGORY` (ip_protocol_iprep_category_e category)

IP Reputation. Returns TRUE if the client IP is categorized as malicious and threat category matches category argument, else returns FALSE.

`Parameters` (expressions not allowed) `:`

category- is IP category

`Returns:` bool_at

- `IS_IPV4`

  Returns TRUE or FALSE depending on whether this is an IPv4 client.

`Returns:` bool_at

- `LAT_LONG`

  Results in text_t containing location as cordinates. Location will be of the form: Latitude,Longitude Expression example: CLIENT.IPV6.SRC.LAT_LONG For example: 36,-119

`Returns:` text_t

- `LOCATION`

Results in list_t containing location. Location will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IPV6.SRC.LOCATION For example: NorthAmerica.US.*.*.*.*

`Returns:` list_t

`LOCATION` (num_at n)

Results in list_t containing location. Location will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IPV6.SRC.LOCATION(2) For example: NorthAmerica.US

`Parameters` (expressions not allowed) `:`

n- is the level up to which location will be returned, the first qualifier is numbered 1.

`Returns:` list_t

`MATCHES_LOCATION` (text_t location)

Results in Boolean TRUE value if and only if the location of the IP matches the location argument. Location string will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IPV6.SRC.MATCHES_LOCATION("qual1.qual2.qual3.*.*.*") For example: CLIENT.IPV6.SRC.MATCHES_LOCATION("NorthAmerica.US.California.*.*.*")

`Parameters` (expressions not allowed) `:`

location- Location to be matched.

`Returns:` bool_at

`MATCHES` (text_t hostname)

Returns Boolean TRUE if hostname IPV6 address matches the current IPV6 address. The hostname string cannot be bigger than 255 characters.

`Parameters` (expressions not allowed) `:`

hostname- HostName

`Returns:` bool_at

`NE` (ipv6_address_at i)

Returns Boolean TRUE if the IP address value is not same as the argument. IPv6 Address specified in one of the valid IPv6 forms like CLIENT.IPV6.DST.EQ(1000:1001:CD10:0000:0000:89AB:4567:CDEF). All valid forms of specifying an IPv6 address are supported.

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` bool_at

`SUBNET` (num_at n)

Returns IPV6 Address Value after applying the subnet which can take values between 0 and 128. For Example: CLIENT.IPV6.SRC.SUBNET(24)

`Parameters` (expressions not allowed) `:`

n- Subnet value. It can take values between 0 and 128.

`Returns:` ipv6_address_at

- `TYPECAST_TEXT_T`

  Typecast the IPv6 Address Value to its string representation.

`Returns:` text_t

IPV6_ADDRESS_PAIR_T

Provides operations for IPv6 address pair

This topic lists the expressions that are provided by this class.

`EQ` (ipv6_address_at i)

Returns boolean TRUE if either source IP or destination IP is same as the argument. Example : CONNECTION.IPv6.EQ(2001:db8:0:0:1::1)

`Parameters` (expressions not allowed) `:`

i- IPv6 address

`Returns:` bool_at

`NE` (ipv6_address_at i)

Returns boolesn TRUE is neither source IP nor Destination IP is same as the argument. Example : CONNECTION.IPv6.NE(2001:db8:0:0:1::1)

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` bool_at

IPV6_ADDRESS_T

This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t ipv6_address_at

- `TYPECAST_IPV6_ADDRESS_AT`

  Convert ipv6_address_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_TEXT_T`

Convert ipv6_address_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current IPv6 address.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPLY_MASK` (ipv6_address_at i)

Returns IPV6 Address Value after applying subnet mask which can take values between 0.0.0.0.0.0.0.0 and ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff

`Parameters` (expressions not allowed)`:`

i- IP Address

`Returns:` ipv6_address_at

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (ipv6_address_at i)

Returns Boolean TRUE if the IP address value is same as the argument. IPv6 Address specified in one of the valid IPv6 forms like

CLIENT.IPV6.DST.EQ(1000:1001:CD10:0000:0000:89AB:4567:CDEF). All valid forms of specifying an IPv6 address are supported.

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET1`

If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 1000, the first set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET1.EQ(0x2058) will return true.

`Returns:` num_at

`*GET2`

If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 1001, the second set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET2.EQ(0x2) will return true.

`Returns:` num_at

`*GET3`

If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return CD10, the third set of 128 bits of the IP address. The IPv6 address is printed using

hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET3.EQ(0x0) will return true.

`Returns:` num_at

`*GET4`

If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 0000, the fourth set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET4.EQ(0x0) will return true.

`Returns:` num_at

`*GET5`

If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 0000, the fifth set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET5.EQ(0x0) will return true.

`Returns:` num_at

`*GET6`

If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 89AB, the sixth set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET6.EQ(0x0) will return true.

`Returns:` num_at

`*GET7`

If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return 4567, the seventh set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET7.EQ(0x230) will return true.

`Returns:` num_at

`*GET8`

If the IP address in the current context is 1000:1001:CD10:0000:0000:89AB:4567:CDEF then it will return CDEF, the eighth set of 128 bits of the IP address. The IPv6 address is printed using hexadecimal digits. If the Client's IPv6 address is 2058:2::230:3a5a then CLIENT.IPV6.SRC.GET8.EQ(0x3a5a) will return true.

`Returns:` num_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This

function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"
```

```
    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IN_SUBNET` (ipv6_subnet_at s)

Returns Boolean TRUE if the IP address value is in the subnet specified by the argument. IPv6 Subnet specified in one of the valid IPv6 forms like CLIENT.IPV6.DST.EQ(1000:1001:CD10:0000:0000:89AB:4567:CDEF/60). All valid forms of specifying an IPv6 address are supported.

`Parameters` (expressions not allowed) `:`

s- IP Subnet

`Returns:` bool_at

`*IPREP_IS_MALICIOUS`

IP Reputation. Returns TRUE if the client IP is categorized as malicious else returns FALSE.

`Returns:` bool_at

`*IPREP_THREAT_CATEGORY` (ip_protocol_iprep_category_e category)

IP Reputation. Returns TRUE if the client IP is categorized as malicious and threat category matches category argument, else returns FALSE.

`Parameters` (expressions not allowed) `:`

category- is IP category

`Returns:` bool_at

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV4`

Returns TRUE or FALSE depending on whether this is an IPv4 client.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LAT_LONG`

Results in text_t containing location as cordinates. Location will be of the form: Latitude,Longitude Expression example: CLIENT.IPV6.SRC.LAT_LONG For example: 36,-119

`Returns:` text_t

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION`

Results in list_t containing location. Location will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IPV6.SRC.LOCATION For example: NorthAmerica.US.*.*.*.*

`Returns:` list_t

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data

from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LOCATION` (num_at n)

Results in list_t containing location. Location will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IPV6.SRC.LOCATION(2) For example: NorthAmerica.US

`Parameters` (expressions not allowed) `:`

n- is the level up to which location will be returned, the first qualifier is numbered 1.

`Returns:` list_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MATCHES_LOCATION` (text_t location)

Results in Boolean TRUE value if and only if the location of the IP matches the location argument. Location string will be of the form: qual1.qual2.qual3.qual4.qual5.qual6 Expression example: CLIENT.IPV6.SRC.MATCHES_LOCATION("qual1.qual2.qual3.*.*.*") For example: CLIENT.IPV6.SRC.MATCHES_LOCATION("NorthAmerica.US.California.*.*.*")

`Parameters` (expressions not allowed) `:`

location- Location to be matched.

`Returns:` bool_at

`*MATCHES` (text_t hostname)

Returns Boolean TRUE if hostname IPV6 address matches the current IPV6 address. The hostname string cannot be bigger than 255 characters.

`Parameters` (expressions not allowed) `:`

hostname- HostName

`Returns:` bool_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (ipv6_address_at i)

Returns Boolean TRUE if the IP address value is not same as the argument. IPv6 Address specified in one of the valid IPv6 forms like CLIENT.IPV6.DST.EQ(1000:1001:CD10:0000:0000:89AB:4567:CDEF). All valid forms of specifying an IPv6 address are supported.

`Parameters` (expressions not allowed) `:`

i- IP Address

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the

public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/ J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/ IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/ Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/ tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/ 5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </ RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may

occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` ipv6_address_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified

encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` ipv6_address_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBNET` (num_at n)

Returns IPV6 Address Value after applying the subnet which can take values between 0 and 128. For Example: CLIENT.IPV6.SRC.SUBNET(24)

`Parameters` (expressions not allowed) `:`

n- Subnet value. It can take values between 0 and 128.

`Returns:` ipv6_address_at

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a

URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9
```

```
    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
```

```
    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>
```

```
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
```

```
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

IPV6_REQ_PROTOCOL_T

IPv6 Protocol Request.

This topic lists the expressions that are provided by this class.

- `DST`

  Returns IPv6 Address Value present in the destination field of the IP Header.

`Returns:` ipv6_address_at

- `PROTOCOL`

  Returns the Protocol of the current packet.

`Returns:` ip_protocol_type_t

- `SRC`

  Returns IPv6 Address Value present in the source field of the IP Header.

`Returns:` ipv6_address_at

IPV6_RES_PROTOCOL_T

IPv6 Protocol Response.

This topic lists the expressions that are provided by this class.

- `DST`

  Returns IPv6 Address Value present in the destination field of the IP Header.

`Returns:` ipv6_address_at

- `PROTOCOL`

  Returns the Protocol of the current packet.

`Returns:` ip_protocol_type_t

- `SRC`

  Returns IPv6 Address Value present in the source field of the IP Header.

`Returns:` ipv6_address_at

IPV6_SUBNET_AT

Provides operations for the integral IPv6 subnet address value.

This topic lists the expressions that are provided by this class.

`APPEND` (text_t str)

Appends the given string to the string representation of the current IPv6 subnet address.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`EQ` (ipv6_subnet_at i)

Returns Boolean TRUE if the IPv6 subnet address value is same as the argument. IPv6 Subnet Address specified must be in following form: 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64

`Parameters``:`

i- IP Subnet Address

`Returns:` bool_at

- `GET1`

  If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 1000, the first set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET1.EQ(0x1000) will return true.

`Returns:` num_at

- `GET2`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 1001, the second set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET2.EQ(0x1001) will return true.

`Returns:` num_at

- `GET3`

  If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return CD10, the third set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET3.EQ(0xCD10) will return true.

`Returns:` num_at

- `GET4`

  If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 0000, the fourth set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET4.EQ(0x0) will return true.

`Returns:` num_at

- `GET5`

  If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 0010, the fifth set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET5.EQ(0x0010) will return true.

`Returns:` num_at

- `GET6`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:00100:89AB:4567:CDEF/64 then it will return 89AB, the sixth set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET6.EQ(0x89AB) will return true.

`Returns:` num_at

- `GET7`

  If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 4567, the seventh set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET7.EQ(0x4567) will return true.

`Returns:` num_at

- `GET8`

  If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return CDEF, the eigth set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET8.EQ(0xCDEF) will return true.

`Returns:` num_at

`NE` (ipv6_subnet_at i)

Returns Boolean TRUE if the IPv6 subnet address value is NOT same as the argument. IPv6 Subnet Address specified must be in following form: 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64

`Parameters``:`

i- IP Subnet Address

`Returns:` bool_at

- `PREFIXLENGTH`

  Returns Network Perfix Length from the given IPv6 Network Address IPv6 Subnet Address specified must be in following form: 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 Then, this function will return 64

`Returns:` num_at

- `TYPECAST_TEXT_T`

  Typecast the IPv6 Subnet Address Value to its string representation.

`Returns:` text_t

IPV6_SUBNET_T

This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t ipv6_subnet_at

- `TYPECAST_IPV6_SUBNET_AT`

  Convert ipv6_subnet_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_TEXT_T`

Convert ipv6_subnet_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current IPv6 subnet address.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot

have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (ipv6_subnet_at i)

Returns Boolean TRUE if the IPv6 subnet address value is same as the argument. IPv6 Subnet Address specified must be in following form: 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64

`Parameters``:`

i- IP Subnet Address

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET1`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 1000, the first set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET1.EQ(0x1000) will return true.

`Returns:` num_at

`*GET2`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 1001, the second set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET2.EQ(0x1001) will return true.

`Returns:` num_at

`*GET3`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return CD10, the third set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET3.EQ(0xCD10) will return true.

`Returns:` num_at

`*GET4`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 0000, the fourth set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET4.EQ(0x0) will return true.

`Returns:` num_at

`*GET5`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 0010, the fifth set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET5.EQ(0x0010) will return true.

`Returns:` num_at

`*GET6`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:00100:89AB:4567:CDEF/64 then it will return 89AB, the sixth set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET6.EQ(0x89AB) will return true.

`Returns:` num_at

`*GET7`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return 4567, the seventh set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET7.EQ(0x4567) will return true.

`Returns:` num_at

`*GET8`

If the IPv6 subnet address in the current context is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then it will return CDEF, the eigth set of 16 bits in the 128 bit address. The IPv6 address is printed using hexadecimal digits. If the IPv6 address is 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 then RADIUS.REQ.AVP(97).VALUE.TYPECAST_IPV6_SUBNET_AT.GET8.EQ(0xCDEF) will return true.

`Returns:` num_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"
```

```
    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (ipv6_subnet_at i)

Returns Boolean TRUE if the IPv6 subnet address value is NOT same as the argument. IPv6 Subnet Address specified must be in following form: 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64

`Parameters``:`

i- IP Subnet Address

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIXLENGTH`

Returns Network Perfix Length from the given IPv6 Network Address IPv6 Subnet Address specified must be in following form: 1000:1001:CD10:0000:0010:89AB:4567:CDEF/64 Then, this function will return 64

`Returns:` num_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter

matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` ipv6_subnet_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` ipv6_subnet_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given

format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a

URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', '"') handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9
```

```
    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
```

```
    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>
```

```
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
```

```
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

KEY_USAGE_E

Defines the bits that are allowed in the Key Usage extension of the X509 certificate.

Enumerations

DIGITAL_SIGNATURE

NONREPUDIATION

KEYENCIPHERMENT

DATAENCIPHERMENT

KEYAGREEMENT

KEYCERTSIGN

CRLSIGN

ENCIPHERONLY

DECIPHERONLY

LIST_AT

List Interface

LIST_T

Provides operations where it assumes that the underlying text is a single character delimited list.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t list_at

- `IGNORE_EMPTY_ELEMENTS`

  This method ignores the empty elements in the list. If the element delimiter in the list is , then the following list a=10,,b=11, ,c=89 has an empty element following a=10. But the element following b=11 is not considered an empty element.

For example: If HTTP Request packet contains the header "Cust_Header" as Cust_Header : 123,,24, ,15 then HTTP.REQ.HEADER("Cust_Header").TYPECAST_LIST_T(',').IGNORE_EMPTY_ELEMENTS.COUNT gives 4, whereas HTTP.REQ.HEADER("Cust_Header").TYPECAST_LIST_T(','). .COUNT gives 5.

`Returns:` list_t

`*TYPECAST_TEXT_T`

Convert list_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_ELEMENT` (text_t s)

Returns Boolean TRUE if the given string argument is a component of the list. The argument string must not contain the list delimiter character. The IGNORECASE and NOIGNORECASE textmode settings are honored and can be used to make the result case insensitive or case sensitive. The URLENCODED and NOURLENCODED textmode do not affect the result of this operation.

`Parameters` (expressions not allowed) `:`

s- List Component

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*COUNT`

Returns a Number Value giving the count of components present in the list. The number of components is equal to the number of delimiters plus one. If the last list component is of zero length or is all white space then the number of components is equal to the number of delimiters.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET` (`uint` i)

Operate as Text on the list component specified by the index present in the argument. The list component index is 0-based. If the argument index is greater than the number of components in the list then the selected text will have zero length.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*GET_REVERSE` (`uint` i)

Operate as Text on the list component specified by the reverse index present in the argument. The list component reverse index is 0-based. The reverse index 0 will select the last component, reverse index 1 will select the last but one component and so on. If the argument index is greater than the number of components in the list then the selected text will have zero length. If the last component of the list is of zero length or has all white spaces then GET_REVERSE(0) starts at the last but one component.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET` (text_t s)

Operate as Text on the list component given by the string argument. The argument string must not contain the list delimiter character. The IGNORECASE and NOIGNORECASE textmode settings are honored and can be used to make the result case insensitive or case sensitive. The URLENCODED and NOURLENCODED textmode do not affect the result of this operation.

`Parameters` (expressions not allowed) `:`

s- Value

`Returns:` text_t

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

Based on RFC2396, following are considered URL safe characters:

Alpha-numeric characters: a-z, A-Z, 0-9

Hyphen and underscore: "-", "_"

Dot: "."

Exclamation mark: "!"

Tilde: "~"

Asterix: "*"

Single quote: "'"

Open and close parentheses: "(", ")"

Semi-colon: ";"

Colon: ":"

At symbol: "@"

Question mark: "?"

Equals: "="

Dollar: "$"

Percent: "%"

Ampersand: "&"

Plus: "+"

Comma: ","

Forward slash: ".html"

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input

text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +
```

```
"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/

5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter

matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` list_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` list_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*SORT`

Sorts the elements of the list. For example, if the input list is 'b,a,c,d,f,e', then the result will be 'a,b,c,d,e,f'.

`Returns:` list_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

MAC_ADDRESS_AT

Provides operations for the 48-bit MAC address value.

This topic lists the expressions that are provided by this class.

`APPEND` (text_t str)

Appends the given string to the string representation of the current MAC address.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`EQ` (mac_address_at m)

Compares the MAC address of the packet source ethernet interface against the MAC address designated in mac, and returns TRUE if they match.

`Parameters` (expressions not allowed) `:`

m- MAC Address

`Returns:` bool_at

- `GET1`

  Returns the hexadecimal code of the first segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 12. So, if the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET1.EQ(0xd6) will return true.

`Returns:` num_at

- `GET2`

  Returns the hexadecimal code of the second segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 34. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET2.EQ(0x96) will return true.

`Returns:` num_at

- `GET3`

  Returns the hexadecimal code of the third segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 56. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET3.EQ(0xa1) will return true.

`Returns:` num_at

- `GET4`

  Returns the hexadecimal code of the fourth segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 78. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET4.EQ(0xa8) will return true.

`Returns:` num_at

- `GET5`

  Returns the hexadecimal code of the fifth segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 9a. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET5.EQ(0x89) will return true.

`Returns:` num_at

- `GET6`

  Returns the hexadecimal code of the sixth segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns bc. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET6.EQ(0xe4) will return true.

`Returns:` num_at

- `TYPECAST_TEXT_T`

  Typecast the MAC Address Value to its string representation.

`Returns:` text_t

MAC_ADDRESS_T

Represents a MAC address present in the 12:34:56:78:9a:bc format.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t mac_address_at

- `TYPECAST_MAC_ADDRESS_AT`

  Convert mac_address_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_TEXT_T`

Convert mac_address_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current MAC address.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot

have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (mac_address_at m)

Compares the MAC address of the packet source ethernet interface against the MAC address designated in mac, and returns TRUE if they match.

`Parameters` (expressions not allowed) `:`

m- MAC Address

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET1`

Returns the hexadecimal code of the first segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 12. So, if the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET1.EQ(0xd6) will return true.

`Returns:` num_at

`*GET2`

Returns the hexadecimal code of the second segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 34. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET2.EQ(0x96) will return true.

`Returns:` num_at

`*GET3`

Returns the hexadecimal code of the third segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 56. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET3.EQ(0xa1) will return true.

`Returns:` num_at

`*GET4`

Returns the hexadecimal code of the fourth segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 78. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET4.EQ(0xa8) will return true.

`Returns:` num_at

`*GET5`

Returns the hexadecimal code of the fifth segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns 9a. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET5.EQ(0x89) will return true.

`Returns:` num_at

`*GET6`

Returns the hexadecimal code of the sixth segment of the destination MAC address. For example, if the MAC address is 12:34:56:78:9a:bc, returns bc. So, If the Client's MAC address is d6:96:a1:a8:89:e4 then CLIENT.ETHER.SRCMAC.GET6.EQ(0xe4) will return true.

`Returns:` num_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` mac_address_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` mac_address_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

MAP_VAR_T

Represents a MAP variable.

This topic lists the expressions that are provided by this class.

- `VALUECOUNT`

  Returns an unsigned long count of the current number of values in the map variable instance.

`Returns:` unsigned_long_at

`VALUEEXISTS` (text_t value_selector)

Returns true if there is a value in the variable instance selected by the value_selector expression; i.e., a key for a map. Otherwise returns false.

`Parameters``:`

value_selector- Key

`Returns:` bool_at

MEDIA_T

Provides expressions to anaylze media content

This topic lists the expressions that are provided by this class.

- `IS_AUDIO`

  Returns TRUE if message is audio

`Returns:` bool_at

- `IS_DASH_STREAM`

  Returns TRUE if message is DASH audio/video stream.

`Returns:` bool_at

- `IS_HLS_STREAM`

  Returns TRUE if message is HLS audio/video stream.

`Returns:` bool_at

- `IS_VIDEO`

  Returns TRUE if message is video

`Returns:` bool_at

MONITOR_T

Operates on a monitor

This topic lists the expressions that are provided by this class.

- `STATUS`

  Return the status of the monitor in string. Returns UP/DOWN as per the monitor status.

`Returns:` text_t

MQTT_AUTH_T

This class provides operations for describing the MQTT AUTH message

This topic lists the expressions that are provided by this class.

- `REASON_CODE`

  Return the reason code in the MQTT AUTH message. Valid for MQTT version 5 onwards.

`Returns:` num_at

MQTT_COMMAND_E

This interface represents one of the MQTT Command types

Enumerations

CONNECT

CONNACK

PUBLISH

PUBACK

PUBREC

PUBREL

PUBCOMP

SUBSCRIBE

SUBACK

UNSUBSCRIBE

UNSUBACK

PINGREQ

PINGRESP

DISCONNECT

AUTH

UNKNOWN

This topic lists the expressions that are provided by this class.

`EQ` (mqtt_command_e m)

The result is Boolean TRUE if the input argument is equal to the MQTT command represented by this interface.

`Parameters` (expressions not allowed) `:`

m- MQTT Command

`Returns:` bool_at

`NE` (mqtt_command_e m)

The result is Boolean TRUE if the input argument is not equal to the MQTT command represented by this interface.

`Parameters` (expressions not allowed) `:`

m- MQTT Command

`Returns:` bool_at

MQTT_CONNACK_FLAGS_E

This interface represents one of the MQTT CONNACK flags.

Enumerations

SESSION_PRESENT

RESERVED_1

RESERVED_2

RESERVED_3

RESERVED_4

RESERVED_5

RESERVED_6

RESERVED_7

MQTT_CONNACK_FLAGS_T

This class provides operations to test the MQTT CONNACK flags

This topic lists the expressions that are provided by this class.

`IS_SET` (mqtt_connack_flags_e flag)

Test a flag bit in the MQTT CONNACK message

`Parameters` (expressions not allowed) `:`

flag- bit

`Returns:` bool_at

MQTT_CONNACK_T

This class provides operations for describing the MQTT CONNACK message

This topic lists the expressions that are provided by this class.

- `FLAGS`

  Return the value of the MQTT CONNACK flags

`Returns:` mqtt_connack_flags_t

- `REASON_CODE`

  Return the reason code of the MQTT CONNACK message

`Returns:` num_at

MQTT_CONNECT_FLAGS_E

This interface represents one of the MQTT CONNECT message flags.

Enumerations

USERNAME

PASSWORD

WILLRETAIN

WILLFLAG

CLEANSESSION

RESERVED

MQTT_CONNECT_FLAGS_T

This interface provides operations to test flags in the MQTT CONNECT message

This topic lists the expressions that are provided by this class.

`IS_SET` (mqtt_connect_flags_e flag)

Test a flag bit in the MQTT CONNECT message

`Parameters` (expressions not allowed) `:`

flag- bit in MQTT CONNECT message

`Returns:` bool_at

- `QOS`

  Return the QOS in the MQTT CONNECT message

`Returns:` num_at

MQTT_CONNECT_T

This class provides operations for describing the MQTT CONNECT message

This topic lists the expressions that are provided by this class.

- `CLIENTID`

  Return the clientid in the MQTT CONNECT message

`Returns:` text_t

- `FLAGS`

  Return the value of the MQTT CONNECT flags

`Returns:` mqtt_connect_flags_t

- `KEEPALIVE`

  Return the keepalive in the MQTT CONNECT message

`Returns:` num_at

- `PASSWORD`

  Return the password in the MQTT CONNECT message

`Returns:` text_t

- `PROTOCOL`

  Return the protocol name in the MQTT CONNECT message

`Returns:` text_t

- `USERNAME`

  Return the username in the MQTT CONNECT message

`Returns:` text_t

- `WILLMSG`

  Return the will message in the MQTT CONNECT message

`Returns:` text_t

- `WILLTOPIC`

  Return the will topic in the MQTT CONNECT message

`Returns:` text_t

MQTT_DISCONNECT_T

This class provides operations for describing the MQTT DISCONNECT message

This topic lists the expressions that are provided by this class.

- `REASON_CODE`

  Return the reason code in the MQTT DISCONNECT message. Valid for MQTT version 5 onwards.

`Returns:` num_at

MQTT_HEADER_T

This class provides operations for describing the generic fields in all MQTT message types

This topic lists the expressions that are provided by this class.

- `IS_DUP`

  Return true if DUP flag is set in the MQTT fixed header

`Returns:` bool_at

- `IS_RETAIN`

  Return true if RETAIN flag is set in the MQTT fixed header

`Returns:` bool_at

- `QOS`

  Return the QOS in the MQTT fixed header

`Returns:` num_at

MQTT_PROTOCOL_T

Models the MQTT message types

This topic lists the expressions that are provided by this class.

- `AUTH`

  Operates on MQTT AUTH message

`Returns:` mqtt_auth_t

- `COMMAND`

  Return the MQTT command type

`Returns:` mqtt_command_e

- `CONNACK`

  Operates on MQTT CONNACK message

`Returns:` mqtt_connack_t

- `CONNECT`

  Operates on MQTT CONNECT message

`Returns:` mqtt_connect_t

- `DISCONNECT`

  Operates on MQTT Disconnect message

`Returns:` mqtt_disconnect_t

- `FROM_CLIENT`

  Returns true if the MQTT message is received from Client

`Returns:` bool_at

- `FROM_SERVER`

  Returns true if the MQTT message is received from Server

`Returns:` bool_at

- `HEADER`

  Return the MQTT fixed header

`Returns:` mqtt_header_t

- `MESSAGE_LENGTH`

  Return the length of the MQTT message

`Returns:` num_at

`NEW_CONNACK` (`uint` errcode)

Creates a new MQTT CONNACK message based on error code. The admin must make sure that the error code being configured is valid as per the protocol version.

`Parameters``:`

errcode- Error Code

`Returns:` text_t

- `PUBACK`

  Operates on MQTT PUBACK message.

`Returns:` mqtt_puback_t

- `PUBCOMP`

  Operates on MQTT PUBCOMP message.

`Returns:` mqtt_pubcomp_t

- `PUBLISH`

  Operates on MQTT PUBLISH message.

`Returns:` mqtt_publish_t

- `PUBREC`

  Operates on MQTT PUBREC message.

`Returns:` mqtt_pubrec_t

- `PUBREL`

  Operates on MQTT PUBREL message.

`Returns:` mqtt_pubrel_t

- `SUBACK`

  Operates on MQTT SUBACK message.

`Returns:` mqtt_suback_t

- `SUBSCRIBE`

  Operates on MQTT SUBSCRIBE message.

`Returns:` mqtt_subscribe_t

- `UNSUBACK`

  Operates on MQTT UNSUBACK message

`Returns:` mqtt_unsuback_t

- `UNSUBSCRIBE`

  Operates on MQTT UNSUBSCRIBE message

`Returns:` mqtt_unsubscribe_t

- `VERSION`

  Return the MQTT protocol version

`Returns:` num_at

MQTT_PUBACK_T

This class provides operations for describing the MQTT PUBACK message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Return the Packet Identifier in the MQTT PUBACK message

`Returns:` num_at

- `REASON_CODE`

  Return the reason code in the MQTT PUBACK message. Valid for MQTT version 5 onwards.

`Returns:` num_at

MQTT_PUBCOMP_T

This class provides operations for describing the MQTT PUBCOMP message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Return the Packet Identifier in the MQTT PUBCOMP message.

`Returns:` num_at

- `REASON_CODE`

  Return the reason code in the MQTT PUBCOMP message. Valid for MQTT version 5 onwards.

`Returns:` num_at

MQTT_PUBLISH_T

This class provides operations for describing the MQTT PUBLISH message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Return the Packet Identifier in the MQTT PUBLISH message.

`Returns:` num_at

- `PAYLOAD`

  Return the payload in the MQTT PUBLISH message.

`Returns:` text_t

- `QOS`

  Return the QOS for the topic in the MQTT PUBLISH message.

`Returns:` num_at

- `TOPIC`

  Return the topic in the MQTT PUBLISH message.

`Returns:` text_t

MQTT_PUBREC_T

This class provides operations for describing the MQTT PUBREC message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Return the Packet Identifier in the MQTT PUBREC message.

`Returns:` num_at

- `REASON_CODE`

  Return the reason code in the MQTT PUBREC message. Valid for MQTT version 5 onwards.

`Returns:` num_at

MQTT_PUBREL_T

This class provides operations for describing the MQTT PUBREL message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Return the Packet Identifier in the MQTT PUBREL message.

`Returns:` num_at

- `REASON_CODE`

  Return the reason code in the MQTT PUBREL message. Valid for MQTT version 5 onwards.

`Returns:` num_at

MQTT_SUB_TOPIC_FILTERS_T

This class provides operations to describe the topic filters in the MQTT SUBSCRIBE message

This topic lists the expressions that are provided by this class.

- `COUNT`

  Return the number of topics in the MQTT SUBSCRIBE message

`Returns:` num_at

- `QOS`

  Return the desired QOS for the first topic in the MQTT SUBSCRIBE message

`Returns:` num_at

`QOS` (`uint` index)

Return the desired QOS indexed at index in the MQTT SUBSCRIBE message

`Parameters``:`

index- index of desired QOS

`Returns:` num_at

- `TOPIC`

  Return the first topic in the MQTT SUBSCRIBE message

`Returns:` text_t

`TOPIC` (`uint` index)

Return the topic indexed at index in the MQTT SUBSCRIBE message

`Parameters``:`

index- index of desired topic

`Returns:` text_t

MQTT_SUBACK_RCODE_FILTER_T

This class provides operations for describing the reason code for the topics in the MQTT SUBACK message

This topic lists the expressions that are provided by this class.

- `COUNT`

  Returns the number of topics for which reason codes are present in the MQTT SUBACK message.

`Returns:` num_at

- `REASON_CODE`

  Return the reason code for the first topic in the MQTT SUBACK message.

`Returns:` num_at

`REASON_CODE` (`uint` index)

Return the reason code for the topic indexed at index in the MQTT SUBACK message.

`Parameters``:`

index- REASON_CODE index

`Returns:` num_at

MQTT_SUBACK_T

This class provides operations for describing the MQTT SUBACK message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Returns the Packet Identifier in the MQTT SUBACK message.

`Returns:` num_at

- `REASON_CODE_FILTER`

  Return the list of reason codes in the MQTT SUBACK message. If there were more topics in the MQTT SUBSCRIBE message, then the SUBACK message will contain the reason codes for each of those topics.

`Returns:` mqtt_suback_rcode_filter_t

MQTT_SUBSCRIBE_T

This class provides operations for describing the MQTT SUBSCRIBE message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Returns the Packet Identifier in the MQTT SUBSCRIBE message.

`Returns:` num_at

- `TOPIC_FILTERS`

  Return the list of topic filters in the MQTT SUBSCRIBE message. If there are multiple topics in the MQTT SUBSCRIBE message, then TOPIC_FILTERS enables accessing individual topics.

`Returns:` mqtt_sub_topic_filters_t

MQTT_UNSUB_TOPIC_FILTERS_T

This class provides operations for describing the MQTT UNSUBSCRIBE message

This topic lists the expressions that are provided by this class.

- `COUNT`

  Return the number of topics in the MQTT UNSUBSCRIBE message

`Returns:` num_at

- `TOPIC`

  Returns the first topic in the MQTT UNSUBSCRIBE message

`Returns:` text_t

`TOPIC` (`uint` index)

Returns the topic indexed at index in the MQTT UNSUBSCRIBE message

`Parameters``:`

index- Topic index

`Returns:` text_t

MQTT_UNSUBACK_RCODE_FILTER_T

This class provides operations for describing the reason code in the MQTT UNSUBACK message

This topic lists the expressions that are provided by this class.

- `COUNT`

  Return the number of topics for which reason codes were received in the MQTT UNSUBACK message. Valid for MQTT version 5 onwards.

`Returns:` num_at

- `REASON_CODE`

  Return the reason code for the first topic in the MQTT UNSUBACK message. Valid for MQTT version 5 onwards.

`Returns:` num_at

`REASON_CODE` (`uint` index)

Return the reason code for the topic indexed at index in the MQTT UNSUBACK message. Valid for MQTT version 5 onwards.

`Parameters``:`

index- REASON_CODE index

`Returns:` num_at

MQTT_UNSUBACK_T

This class provides operations for describing the MQTT UNSUBACK message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Returns the Packet Identifier in the MQTT UNSUBACK message

`Returns:` num_at

- `REASON_CODE_FILTER`

  If there are more topics in the MQTT UNSUBSCRIBE message, then the MQTT UNSUBACK message will contain the reason codes for each of those topics.

`Returns:` mqtt_unsuback_rcode_filter_t

MQTT_UNSUBSCRIBE_T

This class provides operations for describing the MQTT UNSUBSCRIBE message

This topic lists the expressions that are provided by this class.

- `PACKET_ID`

  Return the Packet Identifier in the MQTT UNSUBSCRIBE message

`Returns:` num_at

- `TOPIC_FILTERS`

  Return the list of topic filters in the MQTT UNSUBSCRIBE message If there are multiple topics in the MQTT UNSUBSCRIBE message, topic_filters enables accessing individual topics

`Returns:` mqtt_unsub_topic_filters_t

MSSQL_CLIENT_T

Operates on MSSQL Client Connection

This topic lists the expressions that are provided by this class.

- `DATABASE`

  Returns the Database name associated with the client.

`Returns:` text_t

- `OPTIONFLAGS1`

  Returns optionflags1 from Client Capabilities

`Returns:` num_at

- `OPTIONFLAGS2`

  Returns optionflags2 from Client Capabilities

`Returns:` num_at

- `OPTIONFLAGS3`

  Returns optionflags3 from Client Capabilities

`Returns:` num_at

- `TYPEFLAGS`

  Returns typeflags from Client Capabilities

`Returns:` num_at

- `USER`

  Returns the Username associated with the client.

`Returns:` text_t

MSSQL_PROTOCOL_T

Models the MSSQL message types.

This topic lists the expressions that are provided by this class.

- `CLIENT`

  Operates on MSSQL Client.

`Returns:` mssql_client_t

- `REQ`

  Operates on MSSQL Request.

`Returns:` mssql_req_t

- `RES`

  Operates on MSSQL Response.

`Returns:` mssql_res_t

MSSQL_REQ_COMMAND_E

This object represents one of the SQL Request Commands.

Enumerations

QUERY

PRETDS7

RPC

RESPONSE

ATTENTION

BULKDATA

TRANSMGR

LOGIN

SSPI

PRELOGIN

COM_UNKNOWN

This topic lists the expressions that are provided by this class.

`EQ` (mssql_req_command_e m)

The result is Boolean TRUE if the input argument is equal to the MSSQL Request Command represented by this object.

`Parameters` (expressions not allowed) `:`

m- MSSQL Request Command Name

`Returns:` bool_at

`NE` (mssql_req_command_e m)

The result is Boolean TRUE if the input argument is not equal to the MSSQL Request Command represented by this object.

`Parameters` (expressions not allowed) `:`

m- MSSQL Request Command Name

`Returns:` bool_at

MSSQL_REQ_QUERY_T

Operates on MSSQL Request Query.

This topic lists the expressions that are provided by this class.

- `COMMAND`

  String for the first keyword of the query. Sets the text mode to case insensitive.

`Returns:` text_t

- `SIZE`

  Integer representing the Size of the request query. Similar to CONTENT_LENGTH property of HTTP.

`Returns:` num_at

- `TEXT`

  Returns string covering the entire query. Sets the text mode to case insensitive.

`Returns:` text_t

`TEXT` (`uint` n)

Returns a string covering the first n bytes of query. Like HTTP.BODY(n) Sets the text mode to case insensitive.

`Parameters``:`

n- Query Length

`Returns:` text_t

- `TYPECAST_SQL_QUERY_T`

  Convert mssql_req_query_t to sql_query_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sql_query_t : Describes a SQL query.)

`Returns:` sql_query_t

MSSQL_REQ_RPC_T

Operates on MSSQL RPC request.

This topic lists the expressions that are provided by this class.

- `BODY`

  Returns the body of the SQL request as a String in the form of parameters represented as "a=b" clauses separated by commas where "a" is the RPC parameter name and "b" is its value.

`Returns:` text_t

`BODY` (`uint` n)

Returns the body of the SQL request as a String in the form of parameters represented as "a=b" clauses separated by commas where "a" is the RPC parameter name and "b" is its value. The parameters lookup is done in first n-bytes of the request, skipping the sql-header. It returns only complete pairs.

`Parameters``:`

n- (RPC body len)

`Returns:` text_t

- `IS_PROCID`

  Does the RPC request contain ProcID? If it returns false it indicates the RPC contains a RPC Name.

`Returns:` bool_at

- `NAME`

  String for the name of the procedure. Sets the text mode to case insensitive.

`Returns:` text_t

- `PROCID`

Integer representing the ProcID of the RPC request.

`Returns:` num_at

MSSQL_REQ_T

Operates on MSSQL Request.

This topic lists the expressions that are provided by this class.

- `COMMAND`

  Enum for the type of request command. The different values of the ENUM will be QUERY, RESPONSE, RPC, ATTENTION etc.

`Returns:` mssql_req_command_e

- `CS_VSERVER`

  Returns the CS vserver serving the current request.

`Returns:` vserver_t

- `LB_VSERVER`

  Returns the LB vserver serving the current request.

`Returns:` vserver_t

- `QUERY`

  returns a Request Query Object.

`Returns:` mssql_req_query_t

- `RPC`

  returns a Request RPC Object.

`Returns:` mssql_req_rpc_t

MSSQL_RES_DONE_T

mssql response done object

This topic lists the expressions that are provided by this class.

- `ROWCOUNT`

  number of rows affected by INSERT/UPDATE/DELETE queries.

`Returns:` unsigned_long_at

- `STATUS`

  status of the done token of the response. The Status MUST be a bitwise 'OR' of the following: 0x00: DONE_FINAL (this DONE is the final DONE in the request). 0x1: DONE_MORE (this DONE message is not the final DONE message in the result batch. Subsequent statements to follow). 0x2: DONE_ERROR (on error occurred on the current command. A preceding ERROR token SHOULD be sent when this bit is set). 0x4: DONE_INXACT (a transaction is in progress). 0x10: DONE_COUNT (the DoneRowCount value is valid. This is used to distinguish between a valid value of 0 for DoneRowCount or just an initialized variable). 0x20: DONE_ATTN (the DONE message is a server acknowledgement of a client ATTENTION message). 0x100: DONE_SRVERROR (used in place of DONE_ERROR when an error occurred on the current command, which is severe enough to require the result set, if any, to be discarded).

`Returns:` num_at

MSSQL_RES_ERROR_T

mssql response error object

This topic lists the expressions that are provided by this class.

- `MESSAGE`

  String for the error message field of the error response.

`Returns:` text_t

- `NUM`

  Error number field of the error response.

`Returns:` num_at

- `STATE`

  Integer for the error state field of the error response, used as a modifier to the error number.

`Returns:` num_at

MSSQL_RES_FIELD_DATATYPE_E

This object represents one of the MSSQL response fields datatype.

Enumerations

INTNTYPE

VARCHRTYPE

DATENTYPE

TIMENTYPE

CHRTYPE

BIGVARCHRTYPE

BIGCHRTYPE

NVARCHRTYPE

NCHRTYPE

UNKNOWN

This topic lists the expressions that are provided by this class.

`EQ` (mssql_res_field_datatype_e m)

The result is Boolean TRUE if the input argument is equal to the MSSQL fields datatype value represented by this object.

`Parameters` (expressions not allowed) `:`

m- MSSQL Response Field's datatype

`Returns:` bool_at

`NE` (mssql_res_field_datatype_e m)

The result is Boolean TRUE if the input argument is not equal to the MSSQL field's datatype value represented by this object.

`Parameters` (expressions not allowed) `:`

m- MSSQL Response Field's datatype

`Returns:` bool_at

MSSQL_RES_FIELD_T

Returns mssql response' field object

This topic lists the expressions that are provided by this class.

- `DATATYPE`

  returns datatype of particular column (table attribute).

`Returns:` mssql_res_field_datatype_e

- `LENGTH`

  returns length of particular column (table attribute).

`Returns:` num_at

- `NAME`

  returns name of particular column (table attribute).

`Returns:` text_t

MSSQL_RES_ROW_T

Returns MSSQL Response Row object

This topic lists the expressions that are provided by this class.

`DOUBLE_ELEM` (`uint` j)

returns double value from j'th column of i'th row of the table. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column.

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` double_at

`IS_NULL_ELEM` (`uint` j)

check if j'th column of i'th row of the table is NULL. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column.

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` bool_at

`NUM_ELEM` (`uint` j)

Returns integer value from j'th column of i'th row of the table. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column.

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` num_at

`TEXT_ELEM` (`uint` j)

Returns string value from j'th column of i'th rows of the table. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column.

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` text_t

MSSQL_RES_T

Operates on MSSQL Response.

This topic lists the expressions that are provided by this class.

`ATLEAST_ROWS_COUNT` (`uint` i)

Checks if response has at least this many rows.

`Parameters` (expressions not allowed) `:`

i- number of rows

`Returns:` bool_at

- `DONE`

  This object provides for the ability to work on Done Token pkt of Response.

`Returns:` mssql_res_done_t

- `ERROR`

  returns Error object representing error number, error msg, etc.

`Returns:` mssql_res_error_t

`FIELD` (`uint` i)

This object provides for the ability to work on individual Field pkts(columns) of the Response.

`Parameters` (expressions not allowed) `:`

i- column number

`Returns:` mssql_res_field_t

`ROW` (`uint` i)

This object provides for the ability to work on individual Row pkts of the Response.

`Parameters` (expressions not allowed) `:`

i- row number

`Returns:` mssql_res_row_t

- `TYPE`

  Enum for the response type. Its values can be ERROR, OK, and RESULT_SET

`Returns:` mssql_res_type_e

MSSQL_RES_TYPE_E

This object represents MSSQL Reponse Types.

Enumerations

OK

ERROR

RESULT_SET

This topic lists the expressions that are provided by this class.

`EQ` (mssql_res_type_e m)

The result is Boolean TRUE if the input argument is equal to the MSSQL Reponse Type represented by this object.

`Parameters` (expressions not allowed) `:`

m- MSSQL Response type Name

`Returns:` bool_at

`NE` (mssql_res_type_e m)

The result is Boolean TRUE if the input argument is not equal to the MSSQL Response Type represented by this object.

`Parameters` (expressions not allowed) `:`

m- MSSQL Response type Name

`Returns:` bool_at

MYSQL_CHARSET_E

This object represents one of the MYSQL Charset.

Enumerations

LATIN2_CZECH_CS

DEC8_SWEDISH_CI

CP850_GENERAL_CI

GREEK_GENERAL_CI

LATIN1_GERMAN1_CI

HP8_ENGLISH_CI

KOI8R_GENERAL_CI

LATIN1_SWEDISH_CI

LATIN2_GENERAL_CI

SWE7_SWEDISH_CI

ASCII_GENERAL_CI

CP1251_BULGARIAN_CI

LATIN1_DANISH_CI

HEBREW_GENERAL_CI

LATIN7_ESTONIAN_CS

LATIN2_HUNGARIAN_CI

KOI8U_GENERAL_CI

CP1251_UKRAINIAN_CI

CP1250_GENERAL_CI

LATIN2_CROATIAN_CI

CP1257_LITHUANIAN_CI

LATIN5_TURKISH_CI

LATIN1_GERMAN2_CI

ARMSCII8_GENERAL_CI

UTF8_GENERAL_CI

CP1250_CZECH_CS

CP866_GENERAL_CI

KEYBCS2_GENERAL_CI

MACCE_GENERAL_CI

MACROMAN_GENERAL_CI

CP852_GENERAL_CI

LATIN7_GENERAL_CI

LATIN7_GENERAL_CS

MACCE_BIN

CP1250_CROATIAN_CI

LATIN1_BIN

LATIN1_GENERAL_CI

LATIN1_GENERAL_CS

CP1251_BIN

CP1251_GENERAL_CI

CP1251_GENERAL_CS

MACROMAN_BIN

CP1256_GENERAL_CI

CP1257_BIN

CP1257_GENERAL_CI

ARMSCII8_BIN

ASCII_BIN

CP1250_BIN

CP1256_BIN

CP866_BIN

DEC8_BIN

GREEK_BIN

HEBREW_BIN

HP8_BIN

KEYBCS2_BIN

KOI8R_BIN

KOI8U_BIN

LATIN2_BIN

LATIN5_BIN

LATIN7_BIN

CP850_BIN

CP852_BIN

SWE7_BIN

UTF8_BIN

GEOSTD8_GENERAL_CI

GEOSTD8_BIN

LATIN1_SPANISH_CI

UTF8_UNICODE_CI

UTF8_ICELANDIC_CI

UTF8_LATVIAN_CI

UTF8_ROMANIAN_CI

UTF8_SLOVENIAN_CI

UTF8_POLISH_CI

UTF8_ESTONIAN_CI

UTF8_SPANISH_CI

UTF8_SWEDISH_CI

UTF8_TURKISH_CI

UTF8_CZECH_CI

UTF8_DANISH_CI

UTF8_LITHUANIAN_CI

UTF8_SLOVAK_CI

UTF8_SPANISH2_CI

UTF8_ROMAN_CI

UTF8_PERSIAN_CI

UTF8_ESPERANTO_CI

UTF8_HUNGARIAN_CI

INVAL_CHARSET

This topic lists the expressions that are provided by this class.

`EQ` (mysql_charset_e m)

The result is Boolean TRUE if the input argument is equal to the MYSQL charset value represented by this object.

`Parameters` (expressions not allowed) `:`

m- MYSQL Character Set Name

`Returns:` bool_at

`NE` (mysql_charset_e m)

The result is Boolean TRUE if the input argument is not equal to the MYSQL charset value represented by this object.

`Parameters` (expressions not allowed) `:`

m- MYSQL Character Set Name

`Returns:` bool_at

MYSQL_CLIENT_T

This Object operates on client part of the MYSQL Connection.

This topic lists the expressions that are provided by this class.

- `CAPABILITIES`

  Returns the Client Flags. The list of possible flag values is in the description of the Handshake Initialisation Packet, for server_capabilities. For some of the bits, the server passed "what it's capable of". The client leaves some of the bits on, adds others and passes back to the server. One important flag is: whether compression is desired. Another interesting one is CLIENT_CONNECT_WITH_DB, which shows the presence of the optional databasename).

`Returns:` num_at

- `CHAR_SET`

  Returns the character set of the client.

`Returns:` mysql_charset_e

- `DATABASE`

  Returns the Database name of the client.

`Returns:` text_t

- `USER`

  Returns the User associated with the client.

`Returns:` text_t

MYSQL_PROTOCOL_T

Models the MYSQL message types.

This topic lists the expressions that are provided by this class.

- `CLIENT`

  Operates on MYSQL Client.

`Returns:` mysql_client_t

- `REQ`

  Operates on MYSQL Request.

`Returns:` mysql_req_t

- `RES`

  Operates on MYSQL Response.

`Returns:` mysql_res_t

MYSQL_REQ_COMMAND_E

This object represents one of the SQL Request Commands.

Enumerations

SLEEP

QUIT

INIT_DB

QUERY

FIELD_LIST

CREATE_DB

DROP_DB

REFRESH

SHUTDOWN

STATISTICS

PROCESS_INFO

CONNECT

PROCESS_KILL

DEBUG

PING

TIME

DELAYED_INSERT

CHANGE_USER

BINLOG_DUMP

TABLE_DUMP

CONNECT_OUT

REGISTER_SLAVE

STMT_PREPARE

STMT_EXECUTE

STMT_SEND_LONG_DATA

STMT_CLOSE

STMT_RESET

SET_OPTION

STMT_FETCH

This topic lists the expressions that are provided by this class.

`EQ` (mysql_req_command_e m)

The result is Boolean TRUE if the input argument is equal to the MYSQL Request Command represented by this object.

`Parameters` (expressions not allowed) `:`

m- MYSQL Request Command Name

`Returns:` bool_at

`NE` (mysql_req_command_e m)

The result is Boolean TRUE if the input argument is not equal to the MYSQL Request Command represented by this object.

`Parameters` (expressions not allowed) `:`

m- MYSQL Request Command Name

`Returns:` bool_at

MYSQL_REQ_QUERY_T

Describes a MySQL query.

This topic lists the expressions that are provided by this class.

- `COMMAND`

  String for the first keyword of the query. Sets the text mode to case insensitive.

`Returns:` text_t

- `SIZE`

  Integer representing the Size of the request query. Similar to CONTENT_LENGTH property of HTTP.

`Returns:` num_at

- `TEXT`

  Returns a string covering the entire query. Sets the text mode to case insensitive.

`Returns:` text_t

`TEXT` (`uint` n)

Returns a string covering the first n bytes of query. Like HTTP.BODY(n). Sets the text mode to case insensitive.

`Parameters``:`

n- first bytes in query

`Returns:` text_t

- `TYPECAST_SQL_QUERY_T`

  Convert mysql_req_query_t to sql_query_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sql_query_t : Describes a SQL query.)

`Returns:` sql_query_t

MYSQL_REQ_T

Operates on MYSQL Request.

This topic lists the expressions that are provided by this class.

- `COMMAND`

  Enum for the type of request command. The different values of the ENUM will be QUERY, INIT_DB, etc.

`Returns:` mysql_req_command_e

- `CS_VSERVER`

  Returns the CS vserver serving the current request.

`Returns:` vserver_t

- `LB_VSERVER`

  Returns the LB vserver serving the current request.

`Returns:` vserver_t

- `QUERY`

  returns Request Query Object.

`Returns:` mysql_req_query_t

MYSQL_RES_ERROR_T

mysql response error.

This topic lists the expressions that are provided by this class.

- `MESSAGE`

  String for the message field of the error response.

`Returns:` text_t

- `NUM`

  Error number field of the error response.

`Returns:` num_at

- `SQLSTATE`

  String for the SqlState field of the error response. The server translates error number values to sqlstate values.

`Returns:` text_t

MYSQL_RES_FIELD_DATATYPE_E

This object represents one of the MYSQL response field datatype.

Enumerations

DECIMAL

TINY

SHORT

LONG

FLOAT

DOUBLE

NULL

TIMESTAMP

LONGLONG

INT24

DATE

TIME

DATETIME

YEAR

NEWDATE

VARCHAR

BIT

NEWDECIMAL

ENUM

SET

TINY_BLOB

MEDIUM_BLOB

LONG_BLOB

BLOB

VAR_STRING

STRING

GEOMETRY

UNKNOWN

This topic lists the expressions that are provided by this class.

`EQ` (mysql_res_field_datatype_e m)

The result is Boolean TRUE if the input argument is equal to the MYSQL fields datatype value represented by this object.

`Parameters` (expressions not allowed) `:`

m- MYSQL Response Field's datatype

`Returns:` bool_at

`NE` (mysql_res_field_datatype_e m)

The result is Boolean TRUE if the input argument is not equal to the MYSQL field's datatype value represented by this object.

`Parameters` (expressions not allowed) `:`

m- MYSQL Response Field's datatype

`Returns:` bool_at

MYSQL_RES_FIELD_T

Returns mysql response field object. It allows to access properties of individual attributes of the query response.

This topic lists the expressions that are provided by this class.

- `CATALOG`

  returns the Catalog name of the column.

`Returns:` text_t

- `CHAR_SET`

  returns charset of the column.

`Returns:` mysql_charset_e

- `DATATYPE`

  returns datatype of the column. possible values in Hex 0x00 DECIMAL 0x01 TINY 0x02 SHORT 0x03 LONG 0x04 FLOAT 0x05 DOUBLE 0x06 NULL 0x07 TIMESTAMP 0x08 LONGLONG 0x09 INT24 0x0a DATE 0x0b TIME 0x0c DATETIME 0x0d YEAR 0x0e NEWDATE 0x0f VARCHAR (new in MySQL 5.0) 0x10 BIT (new in MySQL 5.0) 0xf6 NEWDECIMAL (new in MYSQL 5.0) 0xf7 ENUM 0xf8 SET 0xf9 TINY_BLOB 0xfa MEDIUM_BLOB 0xfb LONG_BLOB 0xfc BLOB 0xfd VAR_STRING 0xfe STRING 0xff GEOMETRY

`Returns:` mysql_res_field_datatype_e

- `DB`

  returns the database name of the column.

`Returns:` text_t

- `DECIMALS`

  The number of positions after the decimal point if the type is DECIMAL or NUMERIC.

`Returns:` num_at

- `FLAGS`

  returns flag values of the column. The possible flag values (in hexadec) 0001 NOT_NULL_FLAG 0002 PRI_KEY_FLAG 0004 UNIQUE_KEY_FLAG 0008 MULTIPLE_KEY_FLAG 0010 BLOB_FLAG 0020 UNSIGNED_FLAG 0040 ZEROFILL_FLAG 0080 BINARY_FLAG 0100 ENUM_FLAG 0200 AUTO_INCREMENT_FLAG 0400 TIMESTAMP_FLAG 0800 SET_FLAG

`Returns:` num_at

- `LENGTH`

  returns length of the column. The value given here may be larger than the actual length, for example an instance of a VARCHAR(2) column may have only 1 character in it.

`Returns:` num_at

- `NAME`

  returns alias name of the column (table attribute).

`Returns:` text_t

- `ORIGINAL_NAME`

  returns alias name of the column (table attribute).

`Returns:` text_t

- `ORIGINAL_TABLE`

  returns table name of the column.

`Returns:` text_t

- `TABLE`

  returns alias table name of the column.

`Returns:` text_t

MYSQL_RES_OK_T

mysql response ok object. Allows to access the ok packet properties of the response.

This topic lists the expressions that are provided by this class.

- `AFFECTED_ROWS`

  number of rows affected by INSERT/UPDATE/DELETE.

`Returns:` unsigned_long_at

- `INSERT_ID`

  If the statement (query) generated any AUTO_INCREMENT number, it is returned here. Otherwise this field contains 0.

`Returns:` unsigned_long_at

- `MESSAGE`

  returns text message after INSERT etc queries.

`Returns:` text_t

- `STATUS`

  Client can use the server status to check if command was inside a transaction. Server status contains a bit string, each bit corresponds to these fields: IN TRANSACTION, AUTO_COMMIT, MORE RESULTS, MULTI QUERY, BAD INDEX USED, NO INDEX USED, CURSOR EXISTS, LAST ROW SEEN, DATABASE DROPPED, and NO BACKSLASH ESCAPES.

`Returns:` num_at

- `WARNING_COUNT`

  returns the warning_count attribute of OK Packet.

`Returns:` num_at

MYSQL_RES_ROW_T

mysql response row object.

This topic lists the expressions that are provided by this class.

`DOUBLE_ELEM` (`uint` j)

returns double value from j'th column of i'th rows of the table. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` double_at

`IS_NULL_ELEM` (`uint` j)

check if j'th column of i'th rows of the table is NULL. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` bool_at

`NUM_ELEM` (`uint` j)

returns int value from j'th column of some i'th rows of the table. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` unsigned_long_at

`TEXT_ELEM` (`uint` j)

returns string value from j'th column of i'th rows of the table. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` text_t

MYSQL_RES_T

Operates on MYSQL Response.

This topic lists the expressions that are provided by this class.

`ATLEAST_ROWS_COUNT` (`uint` i)

Checks if response has at least this many rows.

`Parameters` (expressions not allowed) `:`

i- number of rows

`Returns:` bool_at

- `ERROR`

  returns error object representing error number, error msg, etc.

`Returns:` mysql_res_error_t

- `FIELDS_COUNT`

  Returns the number of columns in the response.

`Returns:` unsigned_long_at

`FIELD` (`uint` i)

This object provides for the ability to work on individual Field pkts of the Response.

`Parameters` (expressions not allowed) `:`

i- pkt number

`Returns:` mysql_res_field_t

- `OK`

  This object provides for the ability to work on OK pkt of response.

`Returns:` mysql_res_ok_t

`ROW` (`uint` i)

This object provides for the ability to work on individual Row pkts of the Response.

`Parameters` (expressions not allowed) `:`

i- row number

`Returns:` mysql_res_row_t

- `TYPE`

  Enum for the response type. Its values can be ERROR, OK, and RESULT_SET.

`Returns:` mysql_res_type_e

MYSQL_RES_TYPE_E

This object represents MYSQL Reponse Types.

Enumerations

OK

ERROR

RESULT_SET

This topic lists the expressions that are provided by this class.

`EQ` (mysql_res_type_e m)

The result is Boolean TRUE if the input argument is equal to the MYSQL Reponse Type represented by this object.

`Parameters` (expressions not allowed) `:`

m- MYSQL Response type Name

`Returns:` bool_at

`NE` (mysql_res_type_e m)

The result is Boolean TRUE if the input argument is not equal to the MYSQL Response Type represented by this object.

`Parameters` (expressions not allowed) `:`

m- MYSQL Response type Name

`Returns:` bool_at

NUM_AT

Number Value

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from

- `ABS`

  Return the absolute value of the number.

`Returns:` num_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let

HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_NUM_AT`

Typecast the Unsigned Long Value to a Number value.

`Returns:` num_at

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

NUM_FORMAT_E

Number Format Enum

Enumerations

DECIMAL

Decimal representation of a positive or a negative integer. White spaces before and after the number are OK

HEX

Hexadecimal representation of a positive or a negative integer. White spaces before and after the number are OK

DECIMAL_PREFIX

Decimal representation of a positive of a negative integer followed by arbitrary characters Examples " -123" " 234 " "- 123abc" "234 abc"

HEX_PREFIX

Hexadecimal representation of a positive integer followed by arbitrary characters Examples "f" "fxyz" " f ff" all represent the number 15.

NUM_T

Provides operations to treat the underlying text as a Number either in the DECIMAL or the HEX format.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t num_at

- `TYPECAST_NUM_AT`

  Convert num_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert num_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"
```

```
    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` num_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a

result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` num_t

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', '"') handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for

parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

NVLIST_AT

Name Value List Interface

NVLIST_T

Treats a Text object as a name-value list with 2 delimiters. Example of a name-value list is abc=1&def=2.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t nvlist_at

- `IGNORE_EMPTY_ELEMENTS`

  This method ignores the empty elements in the nv-list. If the element (i.e. the second) delimiter in the nv-list is ; then the following list a=10;;b=11; ;c=89 has an empty element following a=10. But the element following b=11 is not considered an empty element.

For Example: If HTTP Request packet contains the header "Cust_Header" as Cust_Header : a=1;;b=2; ;c=3 then HTTP.REQ.HEADER("Cust_Header").TYPECAST_NVLIST_T('=',';'). IGNORE_EMPTY_ELEMENTS.COUNT gives 4, whereas HTTP.REQ.HEADER("Cust_Header").TYPECAST_NVLIST_T('=',';'). .COUNT gives 5.

`Returns:` nvlist_t

`*TYPECAST_LIST_T`

Treats this name-value pair list as a simple list_t separated by the same element separator ("delimiter2"). Note that lists do not honor the quote characters, so any nvlist_t entry that has quotes and a quoted entry includes a separator will be split at that embedded separator. Empty elements will not be ignored.

`Returns:` list_t

`*TYPECAST_TEXT_T`

Convert nvlist_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*COUNT`

Return a Number Value giving the number of name-value components in the list. If the last Name-Value List component is of zero length or is all spaces then it is ignored.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

Based on RFC2396, following are considered URL safe characters:

Alpha-numeric characters: a-z, A-Z, 0-9

Hyphen and underscore: "-", "_"

Dot: "."

Exclamation mark: "!"

Tilde: "~"

Asterix: "*"

Single quote: "'"

Open and close parentheses: "(", ")"

Semi-colon: ";"

Colon: ":"

At symbol: "@"

Question mark: "?"

Equals: "="

Dollar: "$"

Percent: "%"

Ampersand: "&"

Plus: "+"

Comma: ","

Forward slash: ".html"

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NAMES`

Extracts a list of only the names from the name-value pair list. For example the list 'a=b,c="d=e,f",g=h' will result in the list 'a,c,g'. Empty elements will be ignored.

`Returns:` list_t

`*NAME` (`uint` i)

Operate as Text on the name component of the specified name-value component in the list. The index of the name-value component given by the argument is 0-based. If the specified index is greater than the number of components then a zero length Text object is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*NAME_VALUE` (`uint` i)

Returns the element in the list identified by the parameter. The parameter is a 0-based index in to the list. The result is a string. If the specified index is greater than the number of components then a zero length string is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*NAME_VALUE` (text_t name)

Operate as Text on the name-value component in the list. The name-value component is specified by the argument by providing the name whose name-value is needed. The first component that matches the name is selected. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` text_t

`*NAME_VALUE` (text_t name, `uint` i)

Operate as Text on the name-value component in the list. The name-value component is specified by the argument by providing the name whose name-value is needed. In a name-value list the same name can be repeated multiple times. The Index argument controls which occurence of the matching name-value component should be selected. The Index is 0-based. If the Index is too big then the Text object that is produced will have zero length. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

i- Index

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XXDP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AUnw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </ RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*REPLACE_ALL_VALUES` (text_t value)

Replaces all the values in each name-value pair with the specified string argument. For example, given argument string "?" the list 'a=b,c=d,e=f' will result in the name-value list 'a=?,c=?,e=?'. Quotes will be stripped from the values being replaced. Empty values will be replaced with the value provided. Empty elements will be preserved.

`Parameters` (expressions not allowed) `:`

value- value to replace existing values

`Returns:` nvlist_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` nvlist_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus

character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` nvlist_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).

- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUES`

Extracts a list of only the values from the name-value pair list. For example the list 'a=b,c=d,e=f' will result in the list 'b,d,f'. Note that lists do not honor the quote characters, so any nvlist_at entry that has quotes and a quoted entry includes a separator will be split at that embedded separator. Quote characters will not be stripped from the values. Empty elements and empty values will be ignored.

`Returns:` list_t

`*VALUE` (`uint` i)

Operate as Text on the value component of the specified name-value component in the list. The index of the name-value component given by the argument is 0-based. If the specified index is greater than the number of components then a zero length Text object is produced.

`Parameters` (expressions not allowed) `:`

i- Index

`Returns:` text_t

`*VALUE` (text_t name)

Operate as Text on the value component of the specified name-value component in the list. The name-value component is specified by the argument by providing the name whose value is needed. The first component that matches the name is selected. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` text_t

`*VALUE` (text_t name, `uint` i)

Operate as Text on the value component of the specified name-value component in the list. The name-value component is specified by the argument by providing the name whose value is needed. In a name-value list the same name can be repeated multiple times. The Index argument controls which occurence of the matching name-value component should be selected. The Index is 0-based. If the Index is too big then the Text object that is produced will have zero length. The matching process honors the IGNORECASE and the NOIGNORECASE text modes. The URLENCODED and the NOURLENCODED text modes are ignored.

`Parameters` (expressions not allowed) `:`

name- Name

i- Index

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",
```

```
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
```

```
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
```

```
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

ORACLE_CLIENT_T

This Object operates on client part of the ORACLE Connection.

This topic lists the expressions that are provided by this class.

- `DATABASE`

  Returns the Database name of the client.

`Returns:` text_t

- `USER`

  Returns the User associated with the client.

`Returns:` text_t

ORACLE_PROTOCOL_T

Models the ORACLE message types.

This topic lists the expressions that are provided by this class.

- `CLIENT`

  Operates on ORACLE Client.

`Returns:` oracle_client_t

- `REQ`

  Operates on ORACLE Request.

`Returns:` oracle_req_t

- `RES`

  Operates on ORACLE Response.

`Returns:` oracle_res_t

ORACLE_REQ_COMMAND_E

This object represents one of the SQL Request Commands.

Enumerations

SLEEP

QUIT

INIT_DB

QUERY

FIELD_LIST

CREATE_DB

DROP_DB

REFRESH

SHUTDOWN

STATISTICS

PROCESS_INFO

CONNECT

PROCESS_KILL

DEBUG

PING

TIME

DELAYED_INSERT

CHANGE_USER

BINLOG_DUMP

TABLE_DUMP

CONNECT_OUT

REGISTER_SLAVE

STMT_PREPARE

STMT_EXECUTE

STMT_SEND_LONG_DATA

STMT_CLOSE

STMT_RESET

SET_OPTION

STMT_FETCH

This topic lists the expressions that are provided by this class.

`EQ` (oracle_req_command_e m)

The result is Boolean TRUE if the input argument is equal to the ORACLE Request Command represented by this object.

`Parameters` (expressions not allowed) `:`

m- ORACLE Request Command Name

`Returns:` bool_at

`NE` (oracle_req_command_e m)

The result is Boolean TRUE if the input argument is not equal to the ORACLE Request Command represented by this object.

`Parameters` (expressions not allowed) `:`

m- ORACLE Request Command Name

`Returns:` bool_at

ORACLE_REQ_QUERY_T

Describes a ORACLE query.

This topic lists the expressions that are provided by this class.

- `COMMAND`

  String for the first keyword of the query. Sets the text mode to case insensitive.

`Returns:` text_t

- `SIZE`

  Integer representing the Size of the request query. Similar to CONTENT_LENGTH property of HTTP.

`Returns:` num_at

- `TEXT`

  Returns a string covering the entire query. Sets the text mode to case insensitive.

`Returns:` text_t

`TEXT` (`uint` n)

Returns a string covering the first n bytes of query. Like HTTP.BODY(n). Sets the text mode to case insensitive.

`Parameters``:`

n- first bytes in query

`Returns:` text_t

- `TYPECAST_SQL_QUERY_T`

  Convert oracle_req_query_t to sql_query_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sql_query_t : Describes a SQL query.)

`Returns:` sql_query_t

ORACLE_REQ_T

Operates on ORACLE Request.

This topic lists the expressions that are provided by this class.

- `COMMAND`

  Enum for the type of request command. The different values of the ENUM will be QUERY, INIT_DB, etc.

`Returns:` oracle_req_command_e

- `CS_VSERVER`

  Returns the CS vserver serving the current request.

`Returns:` vserver_t

- `LB_VSERVER`

  Returns the LB vserver serving the current request.

`Returns:` vserver_t

- `QUERY`

  returns Request Query Object.

`Returns:` oracle_req_query_t

ORACLE_RES_ROW_T

Returns ORACLE Response Row object

This topic lists the expressions that are provided by this class.

`IS_NULL_ELEM` (`uint` j)

check if j'th column of i'th row of the table is NULL. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column.

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` bool_at

`NUM_ELEM` (`uint` j)

Returns integer value from j'th column of i'th row of the table. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column.

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` num_at

`TEXT_ELEM` (`uint` j)

Returns string value from j'th column of i'th rows of the table. Following C conventions, both index i and j start from 0 only, hence row i and comlumn j is actually (i+1)th row and (j+1)th column.

`Parameters` (expressions not allowed) `:`

j- column number

`Returns:` text_t

ORACLE_RES_T

Operates on ORACLE Response.

This topic lists the expressions that are provided by this class.

`ATLEAST_ROWS_COUNT` (`uint` i)

Checks if response has at least this many rows.

`Parameters` (expressions not allowed) `:`

i- number of rows

`Returns:` bool_at

`ROW` (`uint` i)

This object provides for the ability to work on individual Row pkts of the Response.

`Parameters` (expressions not allowed) `:`

i- row number

`Returns:` oracle_res_row_t

PACKET_T

Designates an expresion that refers to a network packet.

This topic lists the expressions that are provided by this class.

- `CONNID`

  Returns the connection ID of current network packet

`Returns:` num_at

- `CS_VSERVER`

  Returns CS vserver

`Returns:` vserver_t

- `DSTIP`

  Returns the destination IP of the current IPv4 packet.

`Returns:` ip_address_at

- `DSTIPV6`

  Returns the destination IP of the current IPv6 packet.

`Returns:` ipv6_address_at

- `DSTPORT`

  Returns the ID of the current packet's TCP/UDP destination port as a number.

`Returns:` num_at

- `IDLETIME`

  Returns connection idle time

`Returns:` num_at

- `INTF`

  Extracts the interface ID of the interface through which the current packet entered the Application Switch, and returns that ID.

`Returns:` interface_t

- `IP`

  Equivalent to SRCIP() || DSTIP()

`Returns:` ip_address_pair_t

- `IPV6`

  Equivalent to SRCIPv6() || DSTIPv6()

`Returns:` ipv6_address_pair_t

- `LB_VSERVER`

  Returns LB vserver

`Returns:` vserver_t

- `PORT`

  equivalent to SRCPORT() || DSTPORT()

`Returns:` port_pair_t

- `PPEID`

  Extracts the ppeid or core ID of the current packet

`Returns:` num_at

- `SERVICE_TYPE`

  Returns connection service type

`Returns:` service_type_e

- `SRCIP`

  Returns the source IP of the current IPv4 packet.

`Returns:` ip_address_at

- `SRCIPV6`

  Returns the source IP of the current IPv6 packet.

`Returns:` ipv6_address_at

- `SRCPORT`

  Returns the ID of the current packet's TCP/UDP source port as a number.

`Returns:` num_at

- `SVCNAME`

  Returns the service name

`Returns:` text_t

- `TCPSTATE`

  Returns TCP connection state

`Returns:` tcp_state_e

- `TRAFFIC_DOMAIN_ID`

  Returns Traffic Domain ID of the current packet

`Returns:` num_at

- `VLANID`

  Returns the ID of the VLAN through which the current packet entered the Application Switch as a number.

`Returns:` num_at

- `VXLANID`

  Returns the VNID of the VXLAN through which the current packet entered the Application Switch as a number.

`Returns:` num_at

PIXL_PREFIX_T

Contains information about all the PIXL prefix tokens.

This topic lists the expressions that are provided by this class.

- `AAA`

  Denotes the AAA context of the current transaction.

`Returns:` aaa_t

- `ANALYTICS`

  Provides access to analytics information and operations.

`Returns:` analytics_t

- `CLIENT`

  Designates an expression that refers to the client. This is the starting point for access into parameters such as Ether and SSL.

`Returns:` client_t

- `CONNECTION`

  Designates an expression that refers to network packet irrespective of flow

`Returns:` packet_t

- `DIAMETER`

  Models the DIAMETER message.

`Returns:` diameter_protocol_t

- `DNS`

  Models the DNS message.

`Returns:` dns_protocol_t

`EXTEND` (`uint` i, `uint` j)

Extends the target area around the matched pattern.

`Parameters` (expressions not allowed) `:`

i- Extension in number of bytes on left side of the pattern.

j- Extension in number of bytes on right side of the pattern.

`Returns:` text_t

- `HTTP`

  Models the HTTP message.

`Returns:` http_protocol_t

- `ICA`

  Models the ICA protocol.

`Returns:` ica_protocol_t

- `ICAP`

  Models the ICAP message.

`Returns:` icap_protocol_t

- `MQTT`

  Models the MQTT message.

`Returns:` mqtt_protocol_t

- `MSSQL`

  Models the MSSQL protocol.

`Returns:` mssql_protocol_t

- `MYSQL`

  Models the MYSQL protocol.

`Returns:` mysql_protocol_t

- `ORACLE`

  Models the ORACLE protocol.

`Returns:` oracle_protocol_t

- `QUIC`

  Models the QUIC message.

`Returns:` quic_t

- `RADIUS`

  Models the RADIUS message.

`Returns:` radius_t

- `SERVER`

  Designates an expression that refers to the server. This is the starting point for access into parameters such as Ether and SSL.

`Returns:` server_t

- `SIP`

  Models the SIP protocol.

`Returns:` sip_protocol_t

- `SMPP`

  Models the SMPP protocol.

`Returns:` smpp_protocol_t

- `SUBSCRIBER`

  Models the Subscriber database attributes.

`Returns:` subscriber_t

- `SYS`

  Designates an expression that refers to the NetScaler, rather than the client or server.

`Returns:` sys_t

- `TARGET`

  Refers to the matched pattern.

`Returns:` text_t

- `TEXT`

  Operates on selected text.

`Returns:` text_t

- `URL`

  URL provides operations for parsing and operating on the URL. The supported format is \[<protocol>://<hostname>\]<path>\[?<query>\]. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.

`Returns:` http_url_t

PORT_PAIR_T

provides operations for the TCP/UDP src/dst port

This topic lists the expressions that are provided by this class.

`BETWEEN` (`uint` i `uint` j)

Returns Boolean TRUE if the source port OR destination port is in between given range. Example : CONNECTION.PORT.BETWEEN(60, 500)

`Parameters` (expressions not allowed) `:`

i- Port Number

j- Port Number

`Returns:` bool_at

`EQ` (`uint` i)

Returns Boolean TRUE if either source port OR destination port is same as the argument. Example : CONNECTION.PORT.EQ(80)

`Parameters` (expressions not allowed) `:`

i- Port Number

`Returns:` bool_at

`GE` (`uint` i)

Returns Boolean TRUE if the source port OR destination port is greater than or equal to the argument. Example : CONNECTION.PORT.GE(80)

`Parameters` (expressions not allowed) `:`

i- Port Number

`Returns:` bool_at

`GT` (`uint` i)

Returns Boolean TRUE if the source port OR destination port is greater than the argument. Example : CONNECTION.PORT.GT(80)

`Parameters` (expressions not allowed) `:`

i- Port Number

`Returns:` bool_at

`LE` (`uint` i)

Returns Boolean TRUE if the source port OR destination port is less than or equal to the argument. Example : CONNECTION.PORT.LE(80)

`Parameters` (expressions not allowed) `:`

i- Port Number

`Returns:` bool_at

`LT` (`uint` i)

Returns Boolean TRUE if the source port OR destination port is less than the argument. Example : CONNECTION.PORT.LT(80)

`Parameters` (expressions not allowed) `:`

i- Port Number

`Returns:` bool_at

`NE` (`uint` i)

Returns Boolean TRUE if both the source port AND destination port are not same as the argument. Example : CONNECTION.PORT.NE(80)

`Parameters` (expressions not allowed) `:`

i- Port Number

`Returns:` bool_at

PROTOCOL_BUFFER_T

gRPC Protocol Buffers interface

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

`BOOL` (ip_address_at key)

Returns a bool value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

`Returns:` bool_at

`*BOOL` (num_at key)

Returns a bool value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

`Returns:` bool_at

`*BOOL` (time_local_at key)

Returns a bool value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

`Returns:` bool_at

`*BOOL` (time_at key)

Returns a bool value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

`Returns:` bool_at

`*BOOL` (unsigned_long_at key)

Returns a bool value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

`Returns:` bool_at

`*BOOL` (ip_address_at key, ip_address_at ix)

Returns a repeated bool value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

ix- contains the index of a repeated field value to return.

`Returns:` bool_at

`*BOOL` (ip_address_at key, num_at ix)

Returns a repeated bool value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

ix- contains the index of a repeated field value to return.

`Returns:` bool_at

`*BOOL` (ip_address_at key, time_local_at ix)

Returns a repeated bool value referenced by field number and index.

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`*BOOL` (ip_address_at key, time_at ix)

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`Parameters` (expressions not allowed) `:`

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ix- contains the index of a repeated field value to return.

`Returns:` bool_at

`*BOOL` (time_local_at key, ip_address_at ix)

Returns a repeated bool value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

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`*BOOL` (unsigned_long_at key, ip_address_at ix)

Returns a repeated bool value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

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`*BOOL` (unsigned_long_at key, num_at ix)

Returns a repeated bool value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

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`*BOOL` (unsigned_long_at key, time_local_at ix)

Returns a repeated bool value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

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`Returns:` bool_at

`*BOOL` (unsigned_long_at key, time_at ix)

Returns a repeated bool value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

ix- contains the index of a repeated field value to return.

`Returns:` bool_at

`*BOOL` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated bool value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the bool to return.

ix- contains the index of a repeated field value to return.

`Returns:` bool_at

`*BYTES` (ip_address_at key)

Returns a byte string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the byte string to return.

`Returns:` text_t

`*BYTES` (num_at key)

Returns a byte string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the byte string to return.

`Returns:` text_t

`*BYTES` (time_local_at key)

Returns a byte string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the byte string to return.

`Returns:` text_t

`*BYTES` (time_at key)

Returns a byte string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the byte string to return.

`Returns:` text_t

`*BYTES` (unsigned_long_at key)

Returns a byte string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the byte string to return.

`Returns:` text_t

`*BYTES` (ip_address_at key, ip_address_at ix)

Returns a repeated byte string referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the byte string to return.

ix- contains the index of a repeated field value to return.

`Returns:` text_t

`*BYTES` (ip_address_at key, num_at ix)

Returns a repeated byte string referenced by field number and index.

`Parameters` (expressions not allowed) `:`

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`*BYTES` (unsigned_long_at key, unsigned_long_at ix)

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the byte string to return.

ix- contains the index of a repeated field value to return.

`Returns:` text_t

`*DOUBLE` (ip_address_at key)

Returns a double referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the double to return.

`Returns:` double_at

`*DOUBLE` (num_at key)

Returns a double referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the double to return.

`Returns:` double_at

`*DOUBLE` (time_local_at key)

Returns a double referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the double to return.

`Returns:` double_at

`*DOUBLE` (time_at key)

Returns a double referenced by key value.

`Parameters` (expressions not allowed) `:`

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`Returns:` double_at

`*DOUBLE` (unsigned_long_at key)

Returns a double referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the double to return.

`Returns:` double_at

`*DOUBLE` (ip_address_at key, ip_address_at ix)

Returns a repeated double referenced by key value and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the double to return.

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`Returns:` double_at

`*DOUBLE` (ip_address_at key, num_at ix)

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`Parameters` (expressions not allowed) `:`

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`Parameters` (expressions not allowed) `:`

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`Returns:` double_at

`*DOUBLE` (unsigned_long_at key, time_at ix)

Returns a repeated double referenced by key value and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the double to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*DOUBLE` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated double referenced by key value and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the double to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*ENUM` (ip_address_at key)

Returns an enum value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

`Returns:` num_at

`*ENUM` (num_at key)

Returns an enum value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

`Returns:` num_at

`*ENUM` (time_local_at key)

Returns an enum value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

`Returns:` num_at

`*ENUM` (time_at key)

Returns an enum value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

`Returns:` num_at

`*ENUM` (unsigned_long_at key)

Returns an enum value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

`Returns:` num_at

`*ENUM` (ip_address_at key, ip_address_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (ip_address_at key, num_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (ip_address_at key, time_local_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (ip_address_at key, time_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (ip_address_at key, unsigned_long_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

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`Returns:` num_at

`*ENUM` (num_at key, ip_address_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

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`Returns:` num_at

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Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (num_at key, time_local_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (num_at key, time_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (num_at key, unsigned_long_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (time_local_at key, ip_address_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*ENUM` (time_local_at key, num_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

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`*ENUM` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated enum value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the enum value to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*FIXED32` (ip_address_at key)

Returns a fixed32 value rerferenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed32 to return.

`Returns:` unsigned_long_at

`*FIXED32` (num_at key)

Returns a fixed32 value rerferenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed32 to return.

`Returns:` unsigned_long_at

`*FIXED32` (time_local_at key)

Returns a fixed32 value rerferenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed32 to return.

`Returns:` unsigned_long_at

`*FIXED32` (time_at key)

Returns a fixed32 value rerferenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed32 to return.

`Returns:` unsigned_long_at

`*FIXED32` (unsigned_long_at key)

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`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*FIXED32` (ip_address_at key, ip_address_at ix)

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`Parameters` (expressions not allowed) `:`

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*FIXED64` (ip_address_at key)

Returns a fixed64 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed64 to return.

`Returns:` unsigned_long_at

`*FIXED64` (num_at key)

Returns a fixed64 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed64 to return.

`Returns:` unsigned_long_at

`*FIXED64` (time_local_at key)

Returns a fixed64 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed64 to return.

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`*FIXED64` (time_at key)

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`*FIXED64` (unsigned_long_at key, unsigned_long_at ix)

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the fixed64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*FLOAT` (ip_address_at key)

Returns a float referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

`Returns:` double_at

`*FLOAT` (num_at key)

Returns a float referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

`Returns:` double_at

`*FLOAT` (time_local_at key)

Returns a float referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

`Returns:` double_at

`*FLOAT` (time_at key)

Returns a float referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

`Returns:` double_at

`*FLOAT` (unsigned_long_at key)

Returns a float referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

`Returns:` double_at

`*FLOAT` (ip_address_at key, ip_address_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (ip_address_at key, num_at ix)

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`Parameters` (expressions not allowed) `:`

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`Returns:` double_at

`*FLOAT` (time_local_at key, time_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (time_local_at key, unsigned_long_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (time_at key, ip_address_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (time_at key, num_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (time_at key, time_local_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (time_at key, time_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (time_at key, unsigned_long_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (unsigned_long_at key, ip_address_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

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`Returns:` double_at

`*FLOAT` (unsigned_long_at key, num_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

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`Returns:` double_at

`*FLOAT` (unsigned_long_at key, time_local_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (unsigned_long_at key, time_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*FLOAT` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated float referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the the field number of the float to return.

ix- contains the index of a repeated field value to return.

`Returns:` double_at

`*INT32` (ip_address_at key)

Returns an int32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int32 to return.

`Returns:` num_at

`*INT32` (num_at key)

Returns an int32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int32 to return.

`Returns:` num_at

`*INT32` (time_local_at key)

Returns an int32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int32 to return.

`Returns:` num_at

`*INT32` (time_at key)

Returns an int32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int32 to return.

`Returns:` num_at

`*INT32` (unsigned_long_at key)

Returns an int32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int32 to return.

`Returns:` num_at

`*INT32` (ip_address_at key, ip_address_at ix)

Returns a repeated int32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*INT32` (ip_address_at key, num_at ix)

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`*INT32` (num_at key, time_local_at ix)

Returns a repeated int32 referenced by field number and index.

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`Returns:` num_at

`*INT32` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated int32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*INT64` (ip_address_at key)

Returns an int64 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int64 to return.

`Returns:` unsigned_long_at

`*INT64` (num_at key)

Returns an int64 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int64 to return.

`Returns:` unsigned_long_at

`*INT64` (time_local_at key)

Returns an int64 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int64 to return.

`Returns:` unsigned_long_at

`*INT64` (time_at key)

Returns an int64 referenced by field number.

`Parameters` (expressions not allowed) `:`

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`*INT64` (unsigned_long_at key)

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the int64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*INT64` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated int64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the int64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*MESSAGE` (ip_address_at key)

Returns a sub message referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

`Returns:` protocol_buffer_t

`*MESSAGE` (num_at key)

Returns a sub message referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

`Returns:` protocol_buffer_t

`*MESSAGE` (time_local_at key)

Returns a sub message referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

`Returns:` protocol_buffer_t

`*MESSAGE` (time_at key)

Returns a sub message referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

`Returns:` protocol_buffer_t

`*MESSAGE` (unsigned_long_at key)

Returns a sub message referenced by key value.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

`Returns:` protocol_buffer_t

`*MESSAGE` (ip_address_at key, ip_address_at ix)

Returns a repeated sub message referenced by key value and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

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`Returns:` protocol_buffer_t

`*MESSAGE` (ip_address_at key, num_at ix)

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`*MESSAGE` (num_at key, ip_address_at ix)

Returns a repeated sub message referenced by key value and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

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`Returns:` protocol_buffer_t

`*MESSAGE` (unsigned_long_at key, time_local_at ix)

Returns a repeated sub message referenced by key value and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

ix- contains the index of a repeated field value to return.

`Returns:` protocol_buffer_t

`*MESSAGE` (unsigned_long_at key, time_at ix)

Returns a repeated sub message referenced by key value and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

ix- contains the index of a repeated field value to return.

`Returns:` protocol_buffer_t

`*MESSAGE` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated sub message referenced by key value and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sub message to return.

ix- contains the index of a repeated field value to return.

`Returns:` protocol_buffer_t

`*SFIXED32` (ip_address_at key)

Returns an sfixed32 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sfixed32 to return.

`Returns:` num_at

`*SFIXED32` (num_at key)

Returns an sfixed32 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sfixed32 to return.

`Returns:` num_at

`*SFIXED32` (time_local_at key)

Returns an sfixed32 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sfixed32 to return.

`Returns:` num_at

`*SFIXED32` (time_at key)

Returns an sfixed32 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sfixed32 to return.

`Returns:` num_at

`*SFIXED32` (unsigned_long_at key)

Returns an sfixed32 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sfixed32 to return.

`Returns:` num_at

`*SFIXED32` (ip_address_at key, ip_address_at ix)

Returns a repeated sfixed32 value referenced by field number and index.

`Parameters` (expressions not allowed) `:`

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ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*SFIXED32` (ip_address_at key, num_at ix)

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`Parameters` (expressions not allowed) `:`

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`Parameters` (expressions not allowed) `:`

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`Returns:` num_at

`*SFIXED64` (ip_address_at key)

Returns an sfixed64 value referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sfixed64 to return.

`Returns:` unsigned_long_at

`*SFIXED64` (num_at key)

Returns an sfixed64 value referenced by field number.

`Parameters` (expressions not allowed) `:`

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`*SFIXED64` (time_local_at key)

Returns an sfixed64 value referenced by field number.

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`*SFIXED64` (time_at key)

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the sfixed64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT32` (ip_address_at key)

Returns an sint32 (zigzag encoded 32 bit int) by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint32 to return.

`Returns:` num_at

`*SINT32` (num_at key)

Returns an sint32 (zigzag encoded 32 bit int) by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint32 to return.

`Returns:` num_at

`*SINT32` (time_local_at key)

Returns an sint32 (zigzag encoded 32 bit int) by field number.

`Parameters` (expressions not allowed) `:`

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`Returns:` num_at

`*SINT32` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated sint32 (zigzag encoded 32 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` num_at

`*SINT64` (ip_address_at key)

Returns an sint64 (zigzag encoded 64 bit int) by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

`Returns:` unsigned_long_at

`*SINT64` (num_at key)

Returns an sint64 (zigzag encoded 64 bit int) by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

`Returns:` unsigned_long_at

`*SINT64` (time_local_at key)

Returns an sint64 (zigzag encoded 64 bit int) by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

`Returns:` unsigned_long_at

`*SINT64` (time_at key)

Returns an sint64 (zigzag encoded 64 bit int) by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

`Returns:` unsigned_long_at

`*SINT64` (unsigned_long_at key)

Returns an sint64 (zigzag encoded 64 bit int) by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

`Returns:` unsigned_long_at

`*SINT64` (ip_address_at key, ip_address_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (ip_address_at key, num_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (ip_address_at key, time_local_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (ip_address_at key, time_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*SINT64` (num_at key, ip_address_at ix)

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`Returns:` unsigned_long_at

`*SINT64` (num_at key, time_local_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*SINT64` (num_at key, time_at ix)

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (time_local_at key, ip_address_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

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`Returns:` unsigned_long_at

`*SINT64` (time_local_at key, num_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (time_local_at key, time_local_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (time_local_at key, time_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

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`*SINT64` (time_local_at key, unsigned_long_at ix)

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (time_at key, ip_address_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (time_at key, num_at ix)

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`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*SINT64` (time_at key, time_local_at ix)

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

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`Returns:` unsigned_long_at

`*SINT64` (time_at key, time_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

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`Returns:` unsigned_long_at

`*SINT64` (unsigned_long_at key, ip_address_at ix)

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`Returns:` unsigned_long_at

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Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

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`Returns:` unsigned_long_at

`*SINT64` (unsigned_long_at key, time_local_at ix)

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`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*SINT64` (unsigned_long_at key, time_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*SINT64` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated sint64 (zigzag encoded 64 bit int) by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the sint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*STRING` (ip_address_at key)

Returns a string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

`Returns:` text_t

`*STRING` (num_at key)

Returns a string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

`Returns:` text_t

`*STRING` (time_local_at key)

Returns a string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

`Returns:` text_t

`*STRING` (time_at key)

Returns a string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

`Returns:` text_t

`*STRING` (unsigned_long_at key)

Returns a string referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

`Returns:` text_t

`*STRING` (ip_address_at key, ip_address_at ix)

Returns a repeated string referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

ix- contains the index of a repeated field value to return.

`Returns:` text_t

`*STRING` (ip_address_at key, num_at ix)

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`Parameters` (expressions not allowed) `:`

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`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

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`*STRING` (unsigned_long_at key, ip_address_at ix)

Returns a repeated string referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

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Returns a repeated string referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

ix- contains the index of a repeated field value to return.

`Returns:` text_t

`*STRING` (unsigned_long_at key, time_local_at ix)

Returns a repeated string referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

ix- contains the index of a repeated field value to return.

`Returns:` text_t

`*STRING` (unsigned_long_at key, time_at ix)

Returns a repeated string referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

ix- contains the index of a repeated field value to return.

`Returns:` text_t

`*STRING` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated string referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the string to return.

ix- contains the index of a repeated field value to return.

`Returns:` text_t

`*TYPECAST_TEXT_T`

Convert protocol_buffer_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*UINT32` (ip_address_at key)

Returns a uint32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

`Returns:` unsigned_long_at

`*UINT32` (num_at key)

Returns a uint32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

`Returns:` unsigned_long_at

`*UINT32` (time_local_at key)

Returns a uint32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

`Returns:` unsigned_long_at

`*UINT32` (time_at key)

Returns a uint32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

`Returns:` unsigned_long_at

`*UINT32` (unsigned_long_at key)

Returns a uint32 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

`Returns:` unsigned_long_at

`*UINT32` (ip_address_at key, ip_address_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (ip_address_at key, num_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (ip_address_at key, time_local_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (ip_address_at key, time_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (ip_address_at key, unsigned_long_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (num_at key, ip_address_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (num_at key, num_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*UINT32` (num_at key, time_local_at ix)

Returns a repeated uint32 referenced by field number and index.

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`Parameters` (expressions not allowed) `:`

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key- contains the field number of the uint32 to return.

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`Returns:` unsigned_long_at

`*UINT32` (time_local_at key, ip_address_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

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`*UINT32` (time_local_at key, num_at ix)

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`Parameters` (expressions not allowed) `:`

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`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*UINT32` (time_local_at key, time_at ix)

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`*UINT32` (time_local_at key, unsigned_long_at ix)

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`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*UINT32` (time_at key, ip_address_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (time_at key, num_at ix)

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`Parameters` (expressions not allowed) `:`

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`*UINT32` (time_at key, time_local_at ix)

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`Parameters` (expressions not allowed) `:`

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`Returns:` unsigned_long_at

`*UINT32` (time_at key, time_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

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`Returns:` unsigned_long_at

`*UINT32` (time_at key, unsigned_long_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (unsigned_long_at key, ip_address_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (unsigned_long_at key, num_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (unsigned_long_at key, time_local_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (unsigned_long_at key, time_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT32` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated uint32 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint32 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (ip_address_at key)

Returns a uint64 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

`Returns:` unsigned_long_at

`*UINT64` (num_at key)

Returns a uint64 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

`Returns:` unsigned_long_at

`*UINT64` (time_local_at key)

Returns a uint64 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

`Returns:` unsigned_long_at

`*UINT64` (time_at key)

Returns a uint64 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

`Returns:` unsigned_long_at

`*UINT64` (unsigned_long_at key)

Returns a uint64 referenced by field number.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

`Returns:` unsigned_long_at

`*UINT64` (ip_address_at key, ip_address_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (ip_address_at key, num_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (ip_address_at key, time_local_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (ip_address_at key, time_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (ip_address_at key, unsigned_long_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (num_at key, ip_address_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (num_at key, num_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (num_at key, time_local_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (num_at key, time_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (num_at key, unsigned_long_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_local_at key, ip_address_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_local_at key, num_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_local_at key, time_local_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_local_at key, time_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_local_at key, unsigned_long_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_at key, ip_address_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_at key, num_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_at key, time_local_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_at key, time_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (time_at key, unsigned_long_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (unsigned_long_at key, ip_address_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (unsigned_long_at key, num_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (unsigned_long_at key, time_local_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (unsigned_long_at key, time_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*UINT64` (unsigned_long_at key, unsigned_long_at ix)

Returns a repeated uint64 referenced by field number and index.

`Parameters` (expressions not allowed) `:`

key- contains the field number of the uint64 to return.

ix- contains the index of a repeated field value to return.

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data

from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of

SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/

IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/

7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` protocol_buffer_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character

using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` protocol_buffer_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

PROXY_PROTOCOL_INFO_T

Provides Proxy protocol information.

This topic lists the expressions that are provided by this class.

- `DSTIP_STR`

  Returns destination IP of proxy protocol information.

`Returns:` text_t

- `DSTPORT`

  Returns destination port of proxy protocol information.

`Returns:` num_at

- `ETHERTYPE`

  Returns ethertype of proxy protocol information.

`Returns:` ether_type_e

- `SRCIP_STR`

  Returns source IP of proxy protocol information.

`Returns:` text_t

- `SRCPORT`

  Returns source port of proxy protoocol information.

`Returns:` num_at

QUIC_T

Models the QUIC packet.

This topic lists the expressions that are provided by this class.

- `CONNECTIONID`

  Returns the connection ID present in the QUIC initial packet.

`Returns:` text_t

- `VERSION`

  Operates on QUIC initial packet.

`Returns:` text_t

RADIUS_AVP_T

Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `AVPLIST_AFTER`

  Returns the region after this AVP in radius message (or in other words returns location at end of this AVP and length covering end of this AVP to end of radius message.

`Returns:` text_t

`*AVPLIST_BEFORE`

Returns the region till this AVP in radius message (or in other words returns location at start of AVPs and length equal to offset of this AVP).

`Returns:` text_t

`*COUNT`

Returns the number of occurences of an AVP in radius message. The system does not keep track of more than 16 AVP occurences of an AVP. The result will be undefined if there are more than 16 instances of that AVP.

`Returns:` num_at

`*EXISTS`

Returns true if the AVP exists in the message.

`Returns:` bool_at

`*INSTANCE` (`uint` instanceno)

Returns instances of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: radius.REQ.AVP(26). However, subsequent instances must be retrieved using this method.

INSTANCE(0) retrieves the first instance, INSTANCE(1) retrieves the second instance, and so on.

For example, to get the second instance, the expression would be: radius.REQ.AVP(282).INSTANCE(1).

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` radius_avp_t

`*LENGTH`

Returns the AVP length including AVP header.

If the AVP is not present, it returns length 0. If multiple occurences of the AVP exist, it returns the length of first occurence.

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert radius_avp_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*VALUE`

Returns the value of first instance of the AVP as OctetString.. If there are multiple occurence of AVP(28). To get the first instance the expression would be: radius.REQ.AVP(28).VALUE.

`Returns:` radius_avp_value_t

`*VALUE` (`uint` instanceno)

Returns value of an instance of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: radius.REQ.AVP(266). However, subsequent instances must be retrieved using this method.

VALUE(0) retrieves the first instance, VALUE(1) retrieves the second instance, and so on.

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` radius_avp_value_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>

<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </
RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` radius_avp_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` radius_avp_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given

format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

RADIUS_AVP_VALUE_T

Provides operations to typecast RADIUS AVP value to Integer value or IP Address.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `TYPECAST_IPV6_ADDRESS_AT`

  Typecast the RADIUS AVP value to an IPv6 Address value.

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_SUBNET_AT`

Typecast the RADIUS AVP value to an IPv6 Subnet address value.

`Returns:` ipv6_subnet_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the RADIUS AVP value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_NUM_AT`

Typecast the RADIUS AVP value to a Number value.

`Returns:` num_at

`*TYPECAST_TEXT_T`

Typecast the RADIUS AVP value to a text value.

`Note:` For known AVP types (mentioned in RFC 2585, 2586) this expression will identify the value data type and perform typecast to string correctly. Example: RADIUS.REQ.AVP(8).VALUE.TYPECAST_TEXT_T will identify that AVP(8) value is Framed IP Address and will return IP Address in dotted decimal format.

However, for AVPs not mentioned in RFC 2585 and 2586 we need to explicitly typecast to ip address or num type. Example: RADIUS.REQ.AVP(8).VALUE.TYPECAST_IP_ADDRESS_AT.TYPECAST_TEXT_T.eq("1.1.1.1")

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the RADIUS AVP value to time value.

`Returns:` time_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the RADIUS AVP value to 8 octets unsigned long value.

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data

from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of

SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/

IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/

7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` radius_avp_value_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character

using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` radius_avp_value_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

RADIUS_CODE_E

This object provides RADIUS message codes.

Enumerations

ACCESS_REQUEST

ACCESS_ACCEPT

ACCESS_REJECT

ACCOUNTING_REQUEST

ACCOUNTING_RESPONSE

ACCESS_CHALLENGE

STATUS_SERVER

STATUS_CLIENT

This topic lists the expressions that are provided by this class.

`EQ` (radius_code_e m)

The result is Boolean TRUE if the input argument is equal to the RADIUS message code by this object.

`Parameters` (expressions not allowed) `:`

m- RADIUS Message Code

`Returns:` bool_at

`NE` (radius_code_e m)

The result is Boolean FALSE if the input argument is equal to the RADIUS message code by this object.

`Parameters` (expressions not allowed) `:`

m- RADIUS Message Code

`Returns:` bool_at

RADIUS_CODE_T

This object provides Num operations and radius_code Type Enum operations on the RADIUS message.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from radius_code_e num_at

- `TYPECAST_NUM_AT`

  Convert radius_code_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (radius_code_e m)

The result is Boolean TRUE if the input argument is equal to the RADIUS message code by this object.

`Parameters` (expressions not allowed) `:`

m- RADIUS Message Code

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (radius_code_e m)

The result is Boolean FALSE if the input argument is equal to the RADIUS message code by this object.

`Parameters` (expressions not allowed) `:`

m- RADIUS Message Code

`Returns:` bool_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

RADIUS_MESSAGE_T

Define common operations for radius.Req or radius.Res.

This topic lists the expressions that are provided by this class.

- `ACCT_MULTI_SESSION_ID`

  Returns the Acct-Multi-Session-Id AVP (code 50) from the message.

`Returns:` radius_avp_t

- `ACCT_SESSION_ID`

  Returns the Acct-Session-ID AVP (code 44) from the message.

`Returns:` radius_avp_t

- `ACCT_STATUS_TYPE`

  Returns the ACCT_STATUS_TYPE AVP (code 40) from the message.

`Returns:` radius_avp_t

- `AVP_END`

  Returns the location at the end of radius message (or in other words end of all AVPs) in radius message.

`Returns:` text_t

- `AVP_LIST`

  Returns the AVP region in radius message (or in other words returns location at start of AVPs and length equal to radius message length excluding header).

`Returns:` text_t

`AVP` (`uint` avpcode)

Returns the specified AVP from the message.

For example, to get the AVP with code 26 from a Request, use the expression: radius.REQ.AVP(26).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` radius_avp_t

`AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP encoded within a Vendor-Specific Radius attribute with the given vendorid from the message.

For example, to get Vendor AVP 1 with vender ID '10415' from a Request, use the expression: radius.REQ.AVP(10, 10415).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor ID

`Returns:` radius_avp_t

- `AVP_START`

  Returns the location at the start of AVPs (or in other words end of radius header) in radius message.

`Returns:` text_t

- `CALLED_STATION_ID`

  Returns the CALLED_STATION_ID AVP (code 30) from the message.

`Returns:` radius_avp_t

- `CALLING_STATION_ID`

  Returns the CALLING_STATION_ID AVP (code 31) from the message.

`Returns:` radius_avp_t

- `CODE`

Returns code header field from the message.

`Returns:` radius_code_t

- `FRAMED_IP_ADDRESS`

  Returns the FRAMED_IP_ADDRESS AVP (code 8) from the message.

`Returns:` radius_avp_t

- `FRAMED_PROTOCOL`

  Returns the FRAMED_PROTOCOL AVP (code 7) from the message.

`Returns:` radius_avp_t

- `IDENTIFIER`

  Returns identifier header field from the message.

`Returns:` num_at

- `LENGTH`

  Returns the Message Length from the message.

`Returns:` num_at

- `NAS_IDENTIFIER`

  Returns the NAS_IDENTIFIER AVP (code 32) from the message.

`Returns:` radius_avp_t

- `NAS_IP_ADDRESS`

  Returns the NAS-IP-ADDRESS AVP (code 4) from the message.

`Returns:` radius_avp_t

- `NAS_PORT`

  Returns the NAS_PORT AVP (code 5) from the message.

`Returns:` radius_avp_t

- `USER_NAME`

Returns the User-Name AVP (code 1) from the message.

`Returns:` radius_avp_t

- `VENDOR_SPECIFIC`

  Returns the Vendor-Id AVP (code 26) from the message.

`Returns:` vendor_spec_radius_avp_t

RADIUS_PROTOCOL_T

RADIUS Protocol

This topic lists the expressions that are provided by this class.

`ATTR_TYPE` (`uint` i)

Returns attribute value for given type

`Parameters``:`

i- Attribute Number

`Returns:` radius_avp_value_t

- `USERNAME`

  Returns user name.

`Returns:` text_t

RADIUS_REQ_T

Retrieves header information and AVPs from radius requests.

AVPs can be retrieved by:

- Directly specifying the AVP codes in the form: radius.REQ.AVP( ). For example, to retrieve the NAS-IP-Address AVP (code 4), you can use the expression: radius.REQ.AVP(4).
- Using aliases that are provided for important AVPs. For example, the User-Name AVP has the alias USER_NAME. So, the expression to retrieve the User-Name AVP by using the alias is radius.req.USER_NAME

`General usage:` radius.REQ.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from radius_message_t

- `TYPECAST_RADIUS_MESSAGE_T`

  Convert radius_req_t to radius_message_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_message_t : Define common operations for radius.Req or radius.Res.)

`Returns:` radius_message_t

`*ACCT_MULTI_SESSION_ID`

Returns the Acct-Multi-Session-Id AVP (code 50) from the message.

`Returns:` radius_avp_t

`*ACCT_SESSION_ID`

Returns the Acct-Session-ID AVP (code 44) from the message.

`Returns:` radius_avp_t

`*ACCT_STATUS_TYPE`

Returns the ACCT_STATUS_TYPE AVP (code 40) from the message.

`Returns:` radius_avp_t

`*AVP_END`

Returns the location at the end of radius message (or in other words end of all AVPs) in radius message.

`Returns:` text_t

`*AVP_LIST`

Returns the AVP region in radius message (or in other words returns location at start of AVPs and length equal to radius message length excluding header).

`Returns:` text_t

`*AVP` (`uint` avpcode)

Returns the specified AVP from the message.

For example, to get the AVP with code 26 from a Request, use the expression: radius.REQ.AVP(26).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` radius_avp_t

`*AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP encoded within a Vendor-Specific Radius attribute with the given vendorid from the message.

For example, to get Vendor AVP 1 with vender ID '10415' from a Request, use the expression: radius.REQ.AVP(10, 10415).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor ID

`Returns:` radius_avp_t

`*AVP_START`

Returns the location at the start of AVPs (or in other words end of radius header) in radius message.

`Returns:` text_t

`*CALLED_STATION_ID`

Returns the CALLED_STATION_ID AVP (code 30) from the message.

`Returns:` radius_avp_t

`*CALLING_STATION_ID`

Returns the CALLING_STATION_ID AVP (code 31) from the message.

`Returns:` radius_avp_t

`*CODE`

Returns code header field from the message.

`Returns:` radius_code_t

`*FRAMED_IP_ADDRESS`

Returns the FRAMED_IP_ADDRESS AVP (code 8) from the message.

`Returns:` radius_avp_t

`*FRAMED_PROTOCOL`

Returns the FRAMED_PROTOCOL AVP (code 7) from the message.

`Returns:` radius_avp_t

`*IDENTIFIER`

Returns identifier header field from the message.

`Returns:` num_at

`*LENGTH`

Returns the Message Length from the message.

`Returns:` num_at

`*NAS_IDENTIFIER`

Returns the NAS_IDENTIFIER AVP (code 32) from the message.

`Returns:` radius_avp_t

`*NAS_IP_ADDRESS`

Returns the NAS-IP-ADDRESS AVP (code 4) from the message.

`Returns:` radius_avp_t

`*NAS_PORT`

Returns the NAS_PORT AVP (code 5) from the message.

`Returns:` radius_avp_t

`*USER_NAME`

Returns the User-Name AVP (code 1) from the message.

`Returns:` radius_avp_t

`*VENDOR_SPECIFIC`

Returns the Vendor-Id AVP (code 26) from the message.

`Returns:` vendor_spec_radius_avp_t

RADIUS_RES_T

Retrieves header information and AVPs from radius responses.

AVPs can be retrieved by:

- Directly specifying the AVP codes in the form: radius.RES.AVP( ). For example, to retrieve the PROXY STATE AVP (code 33), you can use the expression: radius.RES.AVP(33).

`General usage:` radius.RES.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from radius_message_t

- `TYPECAST_RADIUS_MESSAGE_T`

  Convert radius_res_t to radius_message_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_message_t : Define common operations for radius.Req or radius.Res.)

`Returns:` radius_message_t

`*ACCT_MULTI_SESSION_ID`

Returns the Acct-Multi-Session-Id AVP (code 50) from the message.

`Returns:` radius_avp_t

`*ACCT_SESSION_ID`

Returns the Acct-Session-ID AVP (code 44) from the message.

`Returns:` radius_avp_t

`*ACCT_STATUS_TYPE`

Returns the ACCT_STATUS_TYPE AVP (code 40) from the message.

`Returns:` radius_avp_t

`*AVP_END`

Returns the location at the end of radius message (or in other words end of all AVPs) in radius message.

`Returns:` text_t

`*AVP_LIST`

Returns the AVP region in radius message (or in other words returns location at start of AVPs and length equal to radius message length excluding header).

`Returns:` text_t

`*AVP` (`uint` avpcode)

Returns the specified AVP from the message.

For example, to get the AVP with code 26 from a Request, use the expression: radius.REQ.AVP(26).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` radius_avp_t

`*AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP encoded within a Vendor-Specific Radius attribute with the given vendorid from the message.

For example, to get Vendor AVP 1 with vender ID '10415' from a Request, use the expression: radius.REQ.AVP(10, 10415).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor ID

`Returns:` radius_avp_t

`*AVP_START`

Returns the location at the start of AVPs (or in other words end of radius header) in radius message.

`Returns:` text_t

`*CALLED_STATION_ID`

Returns the CALLED_STATION_ID AVP (code 30) from the message.

`Returns:` radius_avp_t

`*CALLING_STATION_ID`

Returns the CALLING_STATION_ID AVP (code 31) from the message.

`Returns:` radius_avp_t

`*CODE`

Returns code header field from the message.

`Returns:` radius_code_t

`*FRAMED_IP_ADDRESS`

Returns the FRAMED_IP_ADDRESS AVP (code 8) from the message.

`Returns:` radius_avp_t

`*FRAMED_PROTOCOL`

Returns the FRAMED_PROTOCOL AVP (code 7) from the message.

`Returns:` radius_avp_t

`*IDENTIFIER`

Returns identifier header field from the message.

`Returns:` num_at

`*LENGTH`

Returns the Message Length from the message.

`Returns:` num_at

`*NAS_IDENTIFIER`

Returns the NAS_IDENTIFIER AVP (code 32) from the message.

`Returns:` radius_avp_t

`*NAS_IP_ADDRESS`

Returns the NAS-IP-ADDRESS AVP (code 4) from the message.

`Returns:` radius_avp_t

`*NAS_PORT`

Returns the NAS_PORT AVP (code 5) from the message.

`Returns:` radius_avp_t

`*USER_NAME`

Returns the User-Name AVP (code 1) from the message.

`Returns:` radius_avp_t

`*VENDOR_SPECIFIC`

Returns the Vendor-Id AVP (code 26) from the message.

`Returns:` vendor_spec_radius_avp_t

RADIUS_T

Provides expressions to retrieve radius header information and radius Header and AVPs (attribute value pairs) from radius requests and responses.

`Note:` The radius implementation is RFC 2865 and 2866 compliant.

This topic lists the expressions that are provided by this class.

- `IS_CLIENT`

  Returns true if this is a radius client connection.

`Returns:` bool_at

- `IS_SERVER`

  Returns true if this is a radius server connection.

`Returns:` bool_at

- `NEW_ACCESSREJECT`

  Creates Radius Access Reject message (Header only) based on Request header.

`Returns:` text_t

`NEW_ANSWER` (`uint` code)

Creates Radius message (Header only) based on Request header.

`Parameters``:`

code- Radius Message code

`Returns:` text_t

`NEW_AVP_INTEGER32` (`uint` avpcode, num_at avpvalue)

Creates new AVP based on given avp code and given Integer32 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, ip_address_at avpvalue)

Creates new AVP based on given avp code and given Interger64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, num_at avpvalue)

Creates new AVP based on given avp code and given Interger64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, time_local_at avpvalue)

Creates new AVP based on given avp code and given Interger64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, time_at avpvalue)

Creates new AVP based on given avp code and given Interger64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_INTEGER64` (`uint` avpcode, unsigned_long_at avpvalue)

Creates new AVP based on given avp code and given Interger64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_IPADDRESS` (`uint` avpcode, ip_address_at avpvalue)

Creates new AVP based on given avp code and given IP address value. Example: RADIUS.NEW_AVP_IPADDRESS(8, 1.1.1.1)

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value as octet string

`Returns:` text_t

`NEW_AVP_IPV6ADDRESS` (`uint` avpcode, ipv6_address_at avpvalue)

Creates new AVP based on given avp code and given IPv6 address value. Example: RADIUS.NEW_AVP_IPV6ADDRESS(95, 127:1:1::1)

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value as octet string

`Returns:` text_t

`NEW_AVP_IPV6SUBNET` (`uint` avpcode, ipv6_subnet_at s)

Creates new AVP based on given avp code and given IPv6 Subnet value. Example: RADIUS.NEW_AVP_IPV6SUBNET(97, 127::1/64)

`Parameters``:`

avpcode- AVP code

s- IPv6 Subnet

`Returns:` text_t

`NEW_AVP` (`uint` avpcode, text_t avpvalue)

Creates new AVP based on given avp code and given value. Example: RADIUS.NEW_AVP(1, "Hemant") Example: RADIUS.NEW_AVP(97, RADIUS.REQ.AVP(97).VALUE(0))

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value as octet string

`Returns:` text_t

`NEW_AVP_TIME` (`uint` avpcode, time_at t)

Creates new AVP based on given avp code and given time value. Example: RADIUS.NEW_AVP(`, GMT May 10h 0m)`

`Parameters`:`

avpcode- AVP code

t- Time

`Returns:` text_t

`NEW_AVP_UNSIGNED32` (`uint` avpcode, `uint` avpvalue)

Creates new AVP based on given avp code and given Unsigned32 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, ip_address_at avpvalue)

Creates new AVP based on given avp code and given unsigned64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, num_at avpvalue)

Creates new AVP based on given avp code and given unsigned64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, time_local_at avpvalue)

Creates new AVP based on given avp code and given unsigned64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, time_at avpvalue)

Creates new AVP based on given avp code and given unsigned64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_AVP_UNSIGNED64` (`uint` avpcode, unsigned_long_at avpvalue)

Creates new AVP based on given avp code and given unsigned64 value.

`Parameters``:`

avpcode- AVP code

avpvalue- AVP value

`Returns:` text_t

`NEW_VENDOR_SPEC_AVP` (`uint` vendorid, text_t avpvalue)

Creates new Vendor-Specific AVP with given vendor id and given value.

`Parameters``:`

vendorid- Vendor ID

avpvalue- AVP value as octet string

`Returns:` text_t

- `REQ`

  Retrieves header information and AVPs from radius requests.

`Returns:` radius_req_t

- `RES`

  Retrieves header information and AVPs from radius responses.

`Returns:` radius_res_t

`

REPLACEMODE_E

Replace Mode Enum

Enumerations

ALL

FIRST_MATCH

SEQ_TEXT_T

Represents the Text Sequence class.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t sequence_at

- `TYPECAST_TEXT_T`

  Convert seq_text_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*COUNT`

Returns the number of elements present in the sequence.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET` (`uint` i)

Returns the element present at position 'i'.

`Parameters` (expressions not allowed) `:`

i- Number

`Returns:` seq_text_t

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"
```

```
    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XXDP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AUnw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </ RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed)`:`

charset- Character Set

`Returns:` seq_text_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` seq_text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has

same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code

258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the

current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses,

A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL

and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example:

HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

SEQUENCE_AT

Finite Sequence Interface

SERVER_ATTR_E

Defines the server attributes allowed in DETERMINE_SERVICES().

Enumerations

NAME

IP

PORT

IPPORT

DESCRIPTION

SERVER_T

Designates an expression that refers to the server. This is the starting point for access into paramters such as Ether and SSL.

This topic lists the expressions that are provided by this class.

- `ETHER`

  Operates on the ethernet protocol data associated with the current packet.

`Returns:` ether_res_protocol_t

- `INTERFACE`

  Designates an expression that refers to the ID of the network interface through which the current packet entered the Application Switch.

`Returns:` interface_res_t

- `IP`

  Operates on the IP protocol data associated with the current packet.

`Returns:` ip_res_protocol_t

- `IPV6`

  Operates on the IPv6 protocol data associated with the current packet.

`Returns:` ipv6_res_protocol_t

- `TCP`

  Operates on the TCP protocol data associated with the current packet.

`Returns:` tcp_res_protocol_t

- `VLAN`

  Operates on the VLAN through which the current packet entered the Application Switch.

`Returns:` vlan_res_t

- `VXLAN`

  Operates on the VXLAN through which the current packet entered the Application Switch.

`Returns:` vxlan_res_t

SERVICE_T

Operates on a service

This topic lists the expressions that are provided by this class.

- `CONNECTIONS`

  Returns number of connections on the service as an unsigned long number.

`Returns:` unsigned_long_at

`MONITOR` (text_t monitor_name)

Used for monitor expressions. These expressions raises an undef if monitor with the given name doesn't exist.

`Parameters``:`

monitor_name- Monitor name

`Returns:` monitor_t

- `NAME`

  Returns the name of the service.

`Returns:` text_t

- `RESPTIME`

  Returns as a number, the response time in micro-seconds. RESPTIME is the TTFB (Time To recieve First Byte) from all the backend services.

`Returns:` num_at

`SNMP_TABLE` (`uint` index)

Returns the load entry in the SNMP table at the given index for the service.

`Parameters` (expressions not allowed)`:`

index- Index Raises an undef when service doesnot have SNMP load table or the given index is out of boundary (valid index values are 0-9).

`Returns:` unsigned_long_at

- `STATE`

  Returns the state of service.

`Returns:` vserver_state_e

- `SURGECOUNT`

  Returns as a number, the number of requests in surge queue of service.

`Returns:` num_at

- `THROUGHPUT`

  Returns throughput of the service in Mbps (Megabits per sec) as an unsigned long number.

`Returns:` unsigned_long_at

SERVICE_TYPE_E

Connection service type

Enumerations

ADNS

ANY

DHCPRA

SVC_DNS

FTP

MONITOR

MONITOR_PING

MONITOR_UDP

NNTP

RPCCLNT

RPCSVRS

RPCSVR

RTSP

SIP_UDP

SNMP

SSL

SSL_BRIDGE

SSL_TCP

TCP

UDP

SVC_HTTP

SVC_MYSQL

SVC_MSSQL

SIP_TCP

SIP_TLS

FIX

SERVICE_UNKNOWN

NAT

SSL_FIX

PKTSTEER

SVC_AAA

This topic lists the expressions that are provided by this class.

`EQ` (service_type_e type)

Returns Boolean True if the Connection service type matches the argument. Example: CONNECTION.SERVICE_TYPE.EQ(TCP)

`Parameters` (expressions not allowed) `:`

type- Service type

`Returns:` bool_at

`NE` (service_type_e type)

Returns Boolean True if the Connection service type do not matches the argument. Example: CONNECTION.SERVICE_TYPE.NE(TCP)

`Parameters` (expressions not allowed) `:`

type- Service type

`Returns:` bool_at

SERVICEGROUP_T

This object represents the servicegroup.

This topic lists the expressions that are provided by this class.

`MEMBER` (text_t ip, `uint` port)

Returns the service member in the servicegroup

`Parameters` (expressions not allowed) `:`

ip- IP address

port- Port

`Returns:` servicemember_t

- `NAME`

  Returns the name of the servicegroup.

`Returns:` text_t

SERVICEMEMBER_T

This object represents the servicemember in the service group.

This topic lists the expressions that are provided by this class.

- `CONNECTIONS`

  Returns number of connections on the service member as an unsigned long number.

`Returns:` unsigned_long_at

`MONITOR` (text_t monitor_name)

Used for monitor expressions. These expressions raises an undef if monitor with the given name doesn't exist.

`Parameters``:`

monitor_name- Monitor name

`Returns:` monitor_t

- `RESPTIME`

  Returns as a number, the response time in micro-seconds. RESPTIME is the TTFB (Time To recieve First Byte) from all the backend service members.

`Returns:` num_at

`SNMP_TABLE` (`uint` index)

Returns the load entry in the SNMP table for the service member at the given index.

`Parameters` (expressions not allowed)`:`

index- Index Raise undef when service member doesnot have SNMP load table or the index is out of boundary(valid index values are 0-9)

`Returns:` unsigned_long_at

- `STATE`

  Returns the state of service member.

`Returns:` vserver_state_e

- `SURGECOUNT`

  Returns as a number, the number of requests in surge queue of service.

`Returns:` num_at

- `THROUGHPUT`

  Returns throughput of the service in Mbps (Megabits per sec) as an unsigned long number.

`Returns:` unsigned_long_at

SERVICEPATH_T

Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `EXISTS`

  Returns true if the AVP exists for the subscriber.

`Returns:` bool_at

`*IS_NEXT` (text_t sfname)

Returns true if the given service function is the next service function to be taken in the servicepath, else returns false.

`Parameters` (expressions not allowed) `:`

sfname- ServiceFunction name

`Returns:` bool_at

`*TYPECAST_TEXT_T`

Convert servicepath_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many

other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"
```

```
    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` servicepath_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` servicepath_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

SIP_ADDRESS_AT

This object provides operations for parsing the SIP To header.

SIP_CALLID_HEADER_T

This object provides operations for parsing the SIP callid header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from sip_header_t

- `TYPECAST_SIP_HEADER_T`

  Convert sip_callid_header_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : Typecast an SIP Header object of a specific type to SIP Header.For example: SIP.REQ.CONTENT_LENGTH.TYPECAST_SIP_HEADER_T)

`Returns:` sip_header_t

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings

longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". SIP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot

have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". SIP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / SIP/2.0\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
SIP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An SIP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 SIP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"
```

```
    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An SIP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in SIP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LIST`

A SIP header can have multiple comma separated parameter list in a single line. LIST operation will give a list of comma separated entities. LIST.GET(0) will select the first entity in the comma separated header line. LIST.GET(1) will select the second entity and so on.

SIP/2.0 200 OK\\r\\n MyHdr: abc;param1=1;param2=2,abc2=second;paramabc2=3\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example : SIP.REQ.HEADER("MyHdr").LIST.GET(1) will return a text object referring to "abc2=second;paramabc2=3"

`Returns:` list_t

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>

<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </
RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at sip://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_callid_header_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character

using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_callid_header_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t

or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides

operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a

number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL

and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert sip_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE` (`uint` lineno)

An SIP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on.

The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
```

```
    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>
```

```
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
```

```
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

SIP_CONTENT_LENGTH_T

The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from sip_header_t num_at

- `TYPECAST_NUM_AT`

  Convert sip_content_length_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_SIP_HEADER_T`

Convert sip_content_length_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : Typecast an SIP Header object of a specific type to SIP Header.For example: SIP.REQ.CONTENT_LENGTH.TYPECAST_SIP_HEADER_T)

`Returns:` sip_header_t

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". SIP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current number.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". SIP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / SIP/2.0\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
SIP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An SIP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 SIP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed)`:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed)`:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"
```

```
    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An SIP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in SIP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LIST`

A SIP header can have multiple comma separated parameter list in a single line. LIST operation will give a list of comma separated entities. LIST.GET(0) will select the first entity in the comma separated header line. LIST.GET(1) will select the second entity and so on.

SIP/2.0 200 OK\\r\\n MyHdr: abc;param1=1;param2=2,abc2=second;paramabc2=3\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example : SIP.REQ.HEADER("MyHdr").LIST.GET(1) will return a text object referring to "abc2=second;paramabc2=3"

`Returns:` list_t

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XXDP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AUnw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at sip://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_content_length_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be

performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_content_length_t

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or

more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the

remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-

value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP

Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Typecast the Number Value to its string representation.

`Returns:` text_t

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE` (`uint` lineno)

An SIP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {
```

```
            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",
```

```
    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>
```

```
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
```

```
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

SIP_FROM_HEADER_T

This object provides operations for parsing the SIP From header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from sip_header_t
sip_address_at

- `TYPECAST_SIP_HEADER_T`

  Convert sip_from_header_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : Typecast an SIP Header object of a specific type to SIP Header.For example: SIP.REQ.CONTENT_LENGTH.TYPECAST_SIP_HEADER_T)

`Returns:` sip_header_t

`*ADDRESS`

Returns the SIP URI in the "To" or "From" header

`Returns:` sip_url_t

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". SIP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". SIP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / SIP/2.0\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
SIP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An SIP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 SIP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DISPLAY_NAME`

Returns the display name in the "To" or "From" header

`Returns:` sip_url_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"
```

```
    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An SIP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in SIP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LIST`

A SIP header can have multiple comma separated parameter list in a single line. LIST operation will give a list of comma separated entities. LIST.GET(0) will select the first entity in the comma separated header line. LIST.GET(1) will select the second entity and so on.

SIP/2.0 200 OK\\r\\n MyHdr: abc;param1=1;param2=2,abc2=second;paramabc2=3\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example : SIP.REQ.HEADER("MyHdr").LIST.GET(1) will return a text object referring to "abc2=second;paramabc2=3"

`Returns:` list_t

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable.

Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too

long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/ J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/ IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/ Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/ tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/ 5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </ RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular

expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at sip://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_from_header_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters.

NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_from_header_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TAG`

Returns the "tag" parameter in the "To" or "From" header

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert sip_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a

Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE` (`uint` lineno)

An SIP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
```

```
    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
```

```
        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",
```

```
            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>
```

```
&lt;/Books>
```

SIP_HEADER_T

The SIP.REQ.HEADER("header name") or SIP.RES.HEADER("header name") object represents the multiple lines of a particular SIP header type. This object is also a Text object. Direct Text operations on this object will mostly operate only on the value in the last header line of this type. Some Text operations like CONTAINS have been overridden to operate on values in all the header lines of this type.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

`AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". SIP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". SIP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / SIP/2.0\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
SIP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An SIP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 SIP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Patset Name

`Returns:` num_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*INSTANCE` (`uint` lineno)

An SIP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in SIP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*LIST`

A SIP header can have multiple comma separated parameter list in a single line. LIST operation will give a list of comma separated entities. LIST.GET(0) will select the first entity in the comma separated header line. LIST.GET(1) will select the second entity and so on.

SIP/2.0 200 OK\\r\\n MyHdr: abc;param1=1;param2=2,abc2=second;paramabc2=3\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example : SIP.REQ.HEADER("MyHdr").LIST.GET(1) will return a text object referring to "abc2=second;paramabc2=3"

`Returns:` list_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular

expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at sip://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*TYPECAST_TEXT_T`

Convert sip_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*VALUE` (`uint` lineno)

An SIP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"
```

```
    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XXDP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AUnw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </ RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_header_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_header_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

SIP_HOSTNAME_T

This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `DOMAIN`

  Operate as Text on the Domain name part of the hostname. If the hostname is www.foobar.com or www.foobar.com:5060, then domain is foobar.com. This operation will return incorrect results if the hostname has an IP address. This method also sets the text mode to case-insensitive. So all text operations after this method will operate in a case-insensitive manner.

`Returns:` text_t

`*EQ` (text_t hostname)

Operates on the text contents of hostname. Results in Boolean TRUE value if the hostname matches the input argument. The comparison will be case-insensitive and if textmode is URLENCODED the hostname will be decoded before comparison. If hostname is www.foobar.com or www.foobar.com., then EQ(www.forbar.com) returns TRUE.

`Parameters``:`

hostname- Hostname

`Returns:` bool_at

`*PORT`

Operate as Number on the port part of the hostname. The string following and including the first : is considered the port value. Examples:

If the hostname is www.foo.com:5060 then the port is ":5060". If the hostname is www.foo.com: then the port is ":". If the hostname is www.foo.com then the port is "" and points to just after ".com".

When the numerical value in the port is missing then it assumes a default value of 5060.

`Returns:` num_t

`*SERVER`

Operate as Text on the Server name part of the hostname. If the hostname is www.foobar.com or www.foobar.com:5060, then server is www.foobar.com. This method also sets the text mode to case-insensitive. So all text operations after this method will operate in a case-insensitive manner.

`Returns:` text_t

`*TYPECAST_TEXT_T`

Convert sip_hostname_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input

text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +
```

```
"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/

5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter

matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_hostname_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_hostname_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given

format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

SIP_METHOD_E

This object represents one of the SIP Request Methods.

Enumerations

INVITE

REGISTER

CANCEL

BYE

ACK

OPTIONS

UNKNOWN_METHOD

This topic lists the expressions that are provided by this class.

`EQ` (sip_method_e m)

The result is Boolean TRUE if the input argument is equal to the SIP Request Method represented by this object.

`Parameters` (expressions not allowed) `:`

m- SIP Request Method Name

`Returns:` bool_at

`NE` (sip_method_e m)

The result is Boolean TRUE if the input argument is not equal to the SIP Request Method represented by this object.

`Parameters` (expressions not allowed) `:`

m- SIP Request Method Name

`Returns:` bool_at

SIP_METHOD_T

This object provides Text operations and SIP Request Method Enum operations on the SIP request method.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t sip_method_e

- `TYPECAST_TEXT_T`

  Convert sip_method_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings

longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (sip_method_e m)

The result is Boolean TRUE if the input argument is equal to the SIP Request Method represented by this object.

`Parameters` (expressions not allowed) `:`

m- SIP Request Method Name

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"
```

```
    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (sip_method_e m)

The result is Boolean TRUE if the input argument is not equal to the SIP Request Method represented by this object.

`Parameters` (expressions not allowed) `:`

m- SIP Request Method Name

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_method_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_method_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

SIP_PROTOCOL_T

This is the starting point for SIP protocol based expressions

This topic lists the expressions that are provided by this class.

- `REQ`

  Operates on SIP Request.

`Returns:` sip_req_t

- `RES`

  Operates on SIP Response.

`Returns:` sip_res_t

SIP_REQ_T

Operates on SIP Request.

This topic lists the expressions that are provided by this class.

`BODY` (`uint` i)

Operate as Text on the SIP request body. The length of the body is equal to the number in the argument. If there aren't enough characters in the body then the entire body is selected.

`Parameters``:`

i- Body length

`Returns:` text_t

- `CALLID`

  Returns the content of the "Callid" header

`Returns:` sip_callid_header_t

- `CONTENT_LENGTH`

  Returns the length of the SIP request as a number.

`Returns:` sip_content_length_t

- `CSEQ`

  Returns the SIP Cseq number

`Returns:` num_t

- `CS_VSERVER`

  Returns the CS vserver serving the current request.

`Returns:` vserver_t

- `FROM`

Returns the content of the "From" header

`Returns:` sip_from_header_t

- `FULL_HEADER`

  Returns the entire request header (including the terminating \\r\\n\\r\\n)

`Returns:` text_t

`HEADER` (text_t header_name)

Returns the contents of the SIP header specified by the String argument. The header name cannot be longer than 32 characters.

`Parameters` (expressions not allowed) `:`

header_name- Header Name

`Returns:` sip_header_t

- `IS_VALID`

  Returns TRUE if the SIP request is properly formed.

`Returns:` bool_at

- `LB_VSERVER`

  Returns the LB vserver serving the current request.

`Returns:` vserver_t

- `METHOD`

  Returns the SIP method object from the request.

`Returns:` sip_method_t

- `TO`

  Returns the content of the "To" header

`Returns:` sip_to_header_t

- `URL`

Obtain the SIP URL object from the request. The Text object backing the SIP URL object has the Text Mode set to URLENCODED by default.

`Returns:` sip_url_t

- `VERSION`

  Returns the SIP version.

`Returns:` sip_version_t

- `VIA`

  Returns the content of the "Via" header

`Returns:` sip_via_header_t

SIP_RES_T

Operates SIP Response.

This topic lists the expressions that are provided by this class.

`BODY` (`uint` i)

Operate as Text on the SIP response body. The length of the body is equal to the number in the argument. If there aren't enough characters in the body then the entire body is selected.

`Parameters``:`

i- Body length

`Returns:` text_t

- `CALLID`

  Returns the content of the "Callid" header

`Returns:` text_t

- `CONTENT_LENGTH`

  Returns the length of the SIP response as a number.

`Returns:` sip_content_length_t

- `CSEQ`

  Returns the SIP Cseq number

`Returns:` num_t

- `FROM`

  Returns the content of the "From" header

`Returns:` sip_from_header_t

- `FULL_HEADER`

Returns the entire response header (including the terminating \\r\\n\\r\\n)

`Returns:` text_t

`HEADER` (text_t header_name)

Returns the contents of the SIP header specified by the String argument. The header name cannot be longer than 32 characters.

`Parameters` (expressions not allowed) `:`

header_name- Header Name

`Returns:` sip_header_t

- `IS_GLOBAL_FAILURE`

  Returns True if response code is 6xx.

`Returns:` bool_at

- `IS_PROVISIONAL`

  Returns True if response code is 1xx.

`Returns:` bool_at

- `IS_REDIRECT`

  Returns True if response code is 3xx

`Returns:` bool_at

- `IS_REQUEST_FAILURE`

  Returns True if response code is 4xx.

`Returns:` bool_at

- `IS_SERVER_FAILURE`

  Returns True if response code is a 5xx.

`Returns:` bool_at

- `IS_SUCCESSFUL`

Returns True if response code is 2xx.

`Returns:` bool_at

- `IS_VALID`

  Returns TRUE if the SIP response is properly formed.

`Returns:` bool_at

- `METHOD`

  Returns the SIP method. this is extracted from the Cseq header in the response.

`Returns:` sip_method_t

- `STATUS`

  Returns the SIP response status code.

`Returns:` num_t

- `STATUS_MSG`

  Returns the SIP response status message.

`Returns:` text_t

- `TO`

  Returns the content of the "To" header

`Returns:` sip_to_header_t

- `VERSION`

  Returns the SIP version.

`Returns:` sip_version_t

- `VIA`

  Returns the content of the "Via" header

`Returns:` sip_via_header_t

SIP_TO_HEADER_T

This object provides operations for parsing the SIP From header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from sip_header_t sip_address_at

- `TYPECAST_SIP_HEADER_T`

  Convert sip_to_header_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : Typecast an SIP Header object of a specific type to SIP Header.For example: SIP.REQ.CONTENT_LENGTH.TYPECAST_SIP_HEADER_T)

`Returns:` sip_header_t

`*ADDRESS`

Returns the SIP URI in the "To" or "From" header

`Returns:` sip_url_t

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". SIP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". SIP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / SIP/2.0\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
SIP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An SIP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 SIP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DISPLAY_NAME`

Returns the display name in the "To" or "From" header

`Returns:` sip_url_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"
```

```
    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An SIP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in SIP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LIST`

A SIP header can have multiple comma separated parameter list in a single line. LIST operation will give a list of comma separated entities. LIST.GET(0) will select the first entity in the comma separated header line. LIST.GET(1) will select the second entity and so on.

SIP/2.0 200 OK\\r\\n MyHdr: abc;param1=1;param2=2,abc2=second;paramabc2=3\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example : SIP.REQ.HEADER("MyHdr").LIST.GET(1) will return a text object referring to "abc2=second;paramabc2=3"

`Returns:` list_t

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable.

Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too

long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/ J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/ IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/ Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/ tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/ 5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </ RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular

expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at sip://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_to_header_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters.

NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_to_header_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TAG`

Returns the "tag" parameter in the "To" or "From" header

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert sip_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a

Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE` (`uint` lineno)

An SIP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
```

```
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
```

```
        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",
```

```
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
```

```
&lt;/Books>
```

SIP_URL_T

SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `HOSTNAME`

  Operate as SIP Host Name on the hostname present in the URL. Sets the text mode to case insensitive. It can not be used in SIP response processing contexts.

`Returns:` sip_hostname_t

`*PROTOCOL`

Operate as Text on the protocol present in the URL. It can not be used in SIP response processing contexts.

`Returns:` text_t

`*TYPECAST_TEXT_T`

Convert sip_url_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*USERNAME`

Operate as Text on the username present in the SIP URI. Sets the text mode to case insensitive.

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many

other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"
```

```
    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_url_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_url_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

SIP_VERSION_T

SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `MAJOR`

  Operate as Number on the major component of the SIP Version string.

`Returns:` num_t

`*MINOR`

Operate as Number on the minor component of the SIP Version string.

`Returns:` num_t

`*TYPECAST_TEXT_T`

Convert sip_version_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED,

NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"
```

```
    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +
```

```
"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_version_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\

\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_version_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

SIP_VIA_HEADER_T

This object provides operations for parsing the SIP Via header.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from sip_header_t

- `BRANCH`

  Returns the BRANCH used for SIP communication

`Returns:` text_t

`*RECEIVED`

Returns the source IP address from the which the end host received the SIP request.

`Returns:` ip_address_at

`*RECEIVED_IPV6`

Returns the source IPV6 address from the which the end host received the SIP request.

`Returns:` ipv6_address_at

`*RPORT`

Returns the RPORT used for SIP communication

`Returns:` num_t

`*SENTBY_ADDRESS`

Returns the IP address of the end host which sent the SIP request.

`Returns:` ip_address_at

`*SENTBY_ADDRESS_IPV6`

Returns the IPV6 address of the end host which sent the SIP request.

`Returns:` ipv6_address_at

`*SENTBY_PORT`

Returns the source port of the end host which send the SIP request.

`Returns:` num_t

`*TYPECAST_SIP_HEADER_T`

Convert sip_via_header_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : Typecast an SIP Header object of a specific type to SIP Header.For example: SIP.REQ.CONTENT_LENGTH.TYPECAST_SIP_HEADER_T)

`Returns:` sip_header_t

`*AFTER_REGEX` (`re` regex)

The AFTER_REGEX operator in this object overrides the Text AFTER_REGEX operator to operate on all the instances of the current header type. Selects the Text after the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

The AFTER_STR operator in this object overrides the Text AFTER_STR operator to operate on all the instances of the current header type. Selects Text after the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").AFTER_STR("111") selects "def" in the last instance of MyHdr, the one with value "111def". SIP.RES.HEADER("MyHdr").AFTER_STR("1ab") selects "c" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

The BEFORE_REGEX operator in this object overrides the Text BEFORE_REGEX operator to operate on all the instances of the current header type. Selects the Text before the text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: SIP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

The BEFORE_STR operator in this object overrides the Text BEFORE_STR operator to operate on all the instances of the current header type. Selects Text before the first occurrence of the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: abc111\\r\\n Content-Length: 200\\r\\n MyHdr: def111\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").BEFORE_STR("111") selects "def" in the last instance of MyHdr, the one with value "def111". SIP.RES.HEADER("MyHdr").BEFORE_STR("bc1") selects "a" in the first instance of MyHdr, the one with value "abc111". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patclass_name)

The CONTAINS_ANY in this object overrides the Text CONTAINS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patclass is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patclass_name)

The CONTAINS_INDEX in this object overrides the Text CONTAINS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patclass that is present in any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patclass_name- Patclass Name

`Returns:` num_at

`*CONTAINS` (text_t s)

The CONTAINS in this object overrides the Text CONTAINS operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input Pattern String is present in any instance of the header value.

GET / SIP/2.0\\r\\n Host: abc.com\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

Examples: SIP.RES.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.RES.HEADER("MyHdr").CONTAINS("bcd") is FALSE.
SIP.REQ.HEADER("MyHdr").CONTAINS("de") is TRUE.
SIP.REQ.HEADER("MyHdr").CONTAINS("bcd") is FALSE. The system does not concatenate the different values. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- Pattern String

`Returns:` bool_at

`*COUNT`

An SIP header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").COUNT will return Number 2. The system does not keep track of more than 15 SIP headers. The result will be undefined if there are more than 15 instances of the header.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

The EQUALS_ANY in this object overrides the Text EQUALS_ANY operator to operate on all the instances of the current header type. Returns Boolean TRUE if any of the patterns associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

The EQUALS_INDEX in this object overrides the Text EQUALS_INDEX operator to operate on all the instances of the current header type. Returns the index of the matching pattern associated with input patset is equal to any instance of the header value. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Patset Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns TRUE if an instance of the current header type exists.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` lineno)

An SIP header can have multiple occurrences. INSTANCE(0) will select the last header line of the current type, INSTANCE(1) will select the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").INSTANCE(1) will return a Text object referring to "MyHdr: abc\\r\\n". It can not be used in SIP response processing contexts.

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'

- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LIST`

A SIP header can have multiple comma separated parameter list in a single line. LIST operation will give a list of comma separated entities. LIST.GET(0) will select the first entity in the comma separated header line. LIST.GET(1) will select the second entity and so on.

SIP/2.0 200 OK\\r\\n MyHdr: abc;param1=1;param2=2,abc2=second;paramabc2=3\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example : SIP.REQ.HEADER("MyHdr").LIST.GET(1) will return a text object referring to "abc2=second;paramabc2=3"

`Returns:` list_t

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too

long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +
```

```
"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </

RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

The REGEX_MATCH operator in this object overrides the Text REGEX_MATCH operator to operate on all the instances of the current header type. Returns Boolean TRUE if the input regular expression matches any instance of the header value. The order in which the header instances will be matched is from the last to the first.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at sip://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended to not use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

The REGEX_SELECT operator in this object overrides the Text REGEX_SELECT operator to operate on all the instances of the current header type. Selects the Text that matches the input regular expression in any instance of the header value. The order in which the header instances will be matched is from the last to the first.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` sip_via_header_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all

%HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sip_via_header_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

The SUBSTR operator in this object overrides the Text SUBSTR operator to operate on all the instances of the current header type. Selects Text that matches the input string argument. The order in which the instances of the header are matched is from the last instance to the first.

SIP/2.0 200 OK\\r\\n MyHdr: 111abc\\r\\n Content-Length: 200\\r\\n MyHdr: 111def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").SUBSTR("111") selects "111" in the last instance of MyHdr, the one with value "111def". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given

format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH

- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert sip_header_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE` (`uint` lineno)

An SIP header can have multiple occurrences. VALUE(0) will select the value in the last header line of the current type, VALUE(1) will select the value in the last but one header line and so on. The counting goes backward. Only the last 15 instances of a header are accessible. Therefore Instance Number cannot be greater than 14.

SIP/2.0 200 OK\\r\\n MyHdr: abc\\r\\n Content-Length: 200\\r\\n MyHdr: def\\r\\n \\r\\n

For example: SIP.RES.HEADER("MyHdr").VALUE(1) will return a Text object referring to "abc\\r\\n".

`Parameters` (expressions not allowed) `:`

lineno- Instance Number

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;

- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

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}
```

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```

SMPP_BIND_E

This object represents one of the Bind Type.

Enumerations

TRANSMITTER

RECEIVER

TRANSCEIVER

This topic lists the expressions that are provided by this class.

`EQ` (smpp_bind_e m)

Result is boolean TRUE if input argument is equal to bind type of this connection.

`Parameters` (expressions not allowed) `:`

m- SMPP Bind Type

`Returns:` bool_at

`NE` (smpp_bind_e m)

Result is boolean TRUE if input argument is equal to bind type of this connection.

`Parameters` (expressions not allowed) `:`

m- SMPP Bind Type

`Returns:` bool_at

SMPP_BINDINFO_T

This object operates on bindinfo message of the SMPP Connection.

This topic lists the expressions that are provided by this class.

- `ADDRESS_RANGE`

  Returns the ESME address or range of the ESME adresses.

`Returns:` text_t

- `ADDR_NPI`

  Returns the Numbering Plan Indicator (NPI) for the ESME address.

`Returns:` num_at

- `ADDR_TON`

  Returns the Type of Number (ToN) of the ESME address.

`Returns:` num_at

- `SYSTEM_ID`

  Returns the ESME system requesting to bind with the Message Center.

`Returns:` text_t

- `SYSTEM_TYPE`

  Returns the ESME system requesting to bind with the Message Center.

`Returns:` text_t

- `TYPE`

  Enum for the type of bind command. The different values of the enum will be TRANSCEIVER/ TRANSMITTER/RECEIVER.

`Returns:` smpp_bind_e

SMPP_PROTOCOL_T

Models the SMPP protocol.

This topic lists the expressions that are provided by this class.

- `BINDINFO`

  Operates on SMPP BINDINFO. BINDINFO contains the parameters used by client while doing bind.

`Returns:` smpp_bindinfo_t

SNI_TEXT_AT

Sni Text Interface

SNMP_TABLE_T

The SYS.VSERVER("vserver name").SNMP_TABLE object represents the snmp load table on the vserver. This table contains the load value aggregated across all the services, servicegroup items bound to the vserver. The load values themselves are retrieved via the snmp load monitor bound to the services and servicegroup items.

This topic lists the expressions that are provided by this class.

- `AVERAGE_VALUE`

  Returns the average value of the load parameter at the index.

`Returns:` unsigned_long_at

SQL_QUERY_T

Describes a SQL query.

SSL_REQ_PROTOCOL_T

SSL Protocol

This topic lists the expressions that are provided by this class.

- `CIPHER_BITS`

  Returns the number of bits in the cryptographic key. Returns 0 if the transaction is not SSL based.

`Returns:` num_at

- `CIPHER_EXPORTABLE`

  Returns TRUE if the SSL cryptographic key is exportable.

`Returns:` bool_at

- `CIPHER_NAME`

  Returns SSL Cipher name. Returns a NULL string if invoked from a non SSL connnection

`Returns:` text_t

- `CLIENT_CERT`

  Returns the SSL client certificate in the current SSL transaction.

`Returns:` x509_certificate_t

- `CLIENT_HELLO`

  Returns SSL Client Hello fields.

`Returns:` client_hello_t

- `DETECTED_DOMAIN`

  Returns SSL detected domain. Returns a NULL string if invoked from a non SSL connnection

`Returns:` text_t

- `IS_SSL`

  Returns TRUE if the current connection is SSL-based.

`Returns:` bool_at

- `JA3_FINGERPRINT`
- `ORIGIN_SERVER_CERT`

  Returns the certificate of Origin Server in the current SSL transaction.

`Returns:` x509_certificate_t

- `VERSION`

  Returns the SSL protocol version. Returns 0 if the transaction is not SSL based. Returns 0x002 if the transaction is SSLv2. Returns 0x300 if the transaction is SSLv3. Returns 0x301 if the transaction is TLSv1.

`Returns:` num_at

SSL_TEXT_T

The client.ssl.client_hello.sni object represents sni. This object is of type text_t.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t sni_text_at

- `TYPECAST_TEXT_T`

  Convert ssl_text_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed)`:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed)`:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"
```

```
    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data

from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of

SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/

IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/

7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` ssl_text_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character

using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` ssl_text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*SNI_CERT`

Operate as SNI on the Ssl Text component. Returns the SSL certificate based on the text provided.

`Returns:` x509_certificate_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a

number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL

and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example:

HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

SSLVPN_MODE_E

This object represents one of the SSLVPN Modes.

Enumerations

SECURE_CLIENT_MODE

CLIENTLESS_TRANSPARENT_MODE

CLIENTLESS_OPAQUE_MODE

CLIENTLESS_ENC_MODE

ICA_PROXY_MODE

UNDEFINED_MODE

This topic lists the expressions that are provided by this class.

`EQ` (sslvpn_mode_e m)

The result is Boolean TRUE if the input argument is equal to the SSLVPN Mode enum represented by this object.This is not used currently since there is no way of passing an enum object from PI expression for comparision.

`Parameters` (expressions not allowed) `:`

m- SSLVPN mode enum

`Returns:` bool_at

SSLVPN_MODE_T

This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t sslvpn_mode_e

- `TYPECAST_TEXT_T`

  Convert sslvpn_mode_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings

longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (sslvpn_mode_e m)

The result is Boolean TRUE if the input argument is equal to the SSLVPN Mode enum represented by this object.This is not used currently since there is no way of passing an enum object from PI expression for comparision.

`Parameters` (expressions not allowed) `:`

m- SSLVPN mode enum

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"
```

```
    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XXDP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AUnw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </ RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed)`:`

charset- Character Set

`Returns:` sslvpn_mode_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` sslvpn_mode_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has

same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code

258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the

current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses,

A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL

and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example:

HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
```

```
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
```

```
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

SSLVPN_REQ_PROTOCOL_T

SSLVPN Protocol

This topic lists the expressions that are provided by this class.

- `IS_SSLVPN`

  Returns TRUE if the current connection is SSLVPN-based.

`Returns:` bool_at

- `MODE`

  Returns sslvpn mode + URL Encoding Valid values are : "SECURE_ACCESS_CLIENT" -> Mode = Vpn Client "CVPN_OPAQUE" -> Mode = ClientlessVPN Url Encoding = Opaque "CVPN_ENCRYPT" -> Mode = ClientlessVPN Url Encoding = Encrypt "CVPN_TRANSPARENT" -> Mode = ClientlessVPN Url Encoding = Transparent "ICAPROXY" -> Mode = ICA

`Returns:` sslvpn_mode_t

STREAM_ACTION_E

This object provides stream analytics action types.

Enumerations

DROP

RESET

STREAM_MODE_E

This object provides stream analytics check limit modes.

Enumerations

BANDWIDTH

REQUEST_RATE

RESPONSE_TIME

CONNECTIONS

STREAM_T

Stream

This topic lists the expressions that are provided by this class.

- `BANDWIDTH`

  Returns the bandwidth on an object.

`Returns:` unsigned_long_at

`CHECK_BREACH_THRESHOLD` (stream_transaction_track_mode_e mode)

Returns true if an object corresponding to the stream identifier has hit maximum breaching transactions threshold. Transaction Tracking needs to be enabled in stream identifier configuration to use this expression. Transaction Tracking mode: RESPONSE TIME in milli seconds. `add stream identifier sid -interval 5 -tracktransactions RESPTIME -maxTransactionThreshold 100 -BreachThreshold 10 Expression: ANALYTIC.STREAM("sid").CHECK_BREACH_THRESHOLD(RESPONSE_TIME)`

`Parameters` (expressions not allowed) `:`

mode- CHECK BREACH mode

`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, ip_address_at maxthreshold)

Returns true if an object corresponding to the stream identifier has hit the limit parameter. mode: BANDWIDTH in kbps, RESPONSE TIME in milli seconds, REQUEST RATE in Requests/second, CONNECTIONS i.e. Total Active Connections. `add stream identifier sid -interval 5 Expression: ANALYTIC.STREAM("sid").check_limit(BANDWIDTH, 100000)` Note: maxthreshold should always be greater than 0.

`Parameters` (expressions not allowed) `:`

mode- Check Limit mode

maxthreshold- Check Limit maximum threshold

`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, num_at maxthreshold)

Returns true if an object corresponding to the stream identifier has hit the limit parameter. mode: BANDWIDTH in kbps, RESPONSE TIME in milli seconds, REQUEST RATE in Requests/second, CONNECTIONS i.e. Total Active Connections. `add stream identifier sid -interval 5 Expression: ANALYTIC.STREAM("sid").check_limit(BANDWIDTH, 100000)` Note: maxthreshold should always be greater than 0.

`Parameters` (expressions not allowed) `:`

mode- Check Limit mode

maxthreshold- Check Limit maximum threshold

`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, time_local_at maxthreshold)

Returns true if an object corresponding to the stream identifier has hit the limit parameter. mode: BANDWIDTH in kbps, RESPONSE TIME in milli seconds, REQUEST RATE in Requests/second, CONNECTIONS i.e. Total Active Connections. `add stream identifier sid -interval 5 Expression: ANALYTIC.STREAM("sid").check_limit(BANDWIDTH, 100000)` Note: maxthreshold should always be greater than 0.

`Parameters` (expressions not allowed) `:`

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maxthreshold- Check Limit maximum threshold

`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, time_at maxthreshold)

Returns true if an object corresponding to the stream identifier has hit the limit parameter. mode: BANDWIDTH in kbps, RESPONSE TIME in milli seconds, REQUEST RATE in Requests/second, CONNECTIONS i.e. Total Active Connections. `add stream identifier sid -interval 5 Expression: ANALYTIC.STREAM("sid").check_limit(BANDWIDTH, 100000)` Note: maxthreshold should always be greater than 0.

`Parameters` (expressions not allowed) `:`

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`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, unsigned_long_at maxthreshold)

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`Parameters` (expressions not allowed) `:`

mode- Check Limit mode

maxthreshold- Check Limit maximum threshold

`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, ip_address_at minthreshold, ip_address_at maxthreshold)

Returns true if an object corresponding to the stream identifier has hit the limit parameter. mode: BANDWIDTH in kbps, RESPONSE TIME in milli seconds, REQUEST RATE in Requests/second, CONNECTIONS i.e. Total Active Connections. `add stream identifier sid -interval 5` `Expression: ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 1000)` Note: maxthreshold and minthreshold cannot be negative. maxthreshold cannot be less than minthreshold. Note: If maxthreshold is 0, then max threshold is not applied. minthreshold and maxthreshold cannot both be zero. `Example:` `ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 0)` Above expression returns true only if Request Rate is less than 10 requests per second. There is no upper limit here.

`Parameters` (expressions not allowed) `:`

mode- Check Limit Mode

minthreshold- Check Limit min threshold

maxthreshold- Check Limit maximum threshold

`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, ip_address_at minthreshold, num_at maxthreshold)

Returns true if an object corresponding to the stream identifier has hit the limit parameter. mode: BANDWIDTH in kbps, RESPONSE TIME in milli seconds, REQUEST RATE in Requests/second, CONNECTIONS i.e. Total Active Connections. `add stream identifier sid -interval 5 Expression: ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 1000)` Note: maxthreshold and minthreshold cannot be negative. maxthreshold cannot be less than minthreshold. Note: If maxthreshold is 0, then max threshold is not applied. minthreshold and maxthreshold cannot both be zero. `Example: ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 0)` Above expression returns true only if Request Rate is less than 10 requests per second. There is no upper limit here.

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Returns true if an object corresponding to the stream identifier has hit the limit parameter. mode: BANDWIDTH in kbps, RESPONSE TIME in milli seconds, REQUEST RATE in Requests/second, CONNECTIONS i.e. Total Active Connections. `add stream identifier sid -interval 5 Expression: ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 1000)` Note: maxthreshold and minthreshold cannot be negative. maxthreshold cannot be less than minthreshold. Note: If maxthreshold is 0, then max threshold is not applied. minthreshold and maxthreshold cannot both be zero. `Example: ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 0)` Above expression returns true only if Request Rate is less than 10 requests per second. There is no upper limit here.

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minthreshold- Check Limit min threshold

maxthreshold- Check Limit maximum threshold

`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, num_at minthreshold, time_local_at maxthreshold)

Returns true if an object corresponding to the stream identifier has hit the limit parameter. mode: BANDWIDTH in kbps, RESPONSE TIME in milli seconds, REQUEST RATE in Requests/second, CONNECTIONS i.e. Total Active Connections. `add stream identifier sid -interval 5 Expression: ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 1000)` Note: maxthreshold and minthreshold cannot be negative. maxthreshold cannot be less than minthreshold. Note: If maxthreshold is 0, then max threshold is not applied. minthreshold and maxthreshold cannot both be zero. `Example: ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 0)` Above expression returns true only if Request Rate is less than 10 requests per second. There is no upper limit here.

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`Returns:` bool_at

`CHECK_LIMIT` (stream_mode_e mode, num_at minthreshold, unsigned_long_at maxthreshold)

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`ANALYTIC.STREAM("sid").check_limit(REQUEST_RATE, 10, 0)` Above expression returns true only if Request Rate is less than 10 requests per second. There is no upper limit here.

`Parameters` (expressions not allowed) `:`

mode- Check Limit Mode

minthreshold- Check Limit min threshold

maxthreshold- Check Limit maximum threshold

`Returns:` bool_at

- `COLLECT_STATS`

  Returns true if statistics collection on an object was successful.

`Returns:` bool_at

`COLLECT_STATS` (`uint` amplification_factor)

Returns true if statistics collection on an object was successful.

`Parameters` (expressions not allowed) `:`

amplification_factor- Amplification factor

`Returns:` bool_at

`COLLECT_STATS` (text_t mode, `uint` max_threshold, stream_action_e action)

Returns true if statistics collection on an object was successful. This expression is used to rate limit connections per packet level. When an object/connection corresponding to the stream identifier has received more than configured percentage (max_threshold) of bad packets, configured action is triggered. `add stream identifier packetcreditrateidentifier packetcreditrateselector -interval 1 add responder policy packetcreditratesessionpolicy "ANALYTICS.STREAM(\"packetcreditrateidentifier\").COLLECT_STATS(\"PACKET_CREDITS\", 75, RESET)" NOOP` Valid mode: PACKET_CREDITS Valid action: RESET/DROP Valid max_threshold: 0-100

`Parameters` (expressions not allowed) `:`

mode- stream mode

max_threshold- maximum threshold percentage of bad packets.

action- Action

`Returns:` bool_at

`COLLECT_STATS` (text_t mode, `uint` max_threshold, stream_action_e action, `uint` type)

Returns true if statistics collection on an object was successful. This expression is used to rate limit packets per second. When an object/connection corresponding to the stream identifier has received more than configured (max_threshold) number of packets, configured action is triggered. `add stream identifier packetrateidentifier packetrateselector -interval 1 add responder policy packetratesessionpolicy "ANALYTICS.STREAM(\"packetrateidentifier\").COLLECT_STATS(\"PACKET_LIMIT\", 5000, RESET, 1)" NOOP` Valid mode: PACKET_LIMIT Valid action: RESET/DROP Valid max_threshold: strictly greater than zero. Valid type: 0/1 0 for bursty 1 for smooth

`Parameters` (expressions not allowed) `:`

mode- stream mode

max_threshold- maximum threshold of packets per second.

action- Action

type- rate limiting type like smooth/bursty.

`Returns:` bool_at

- `CONNECTIONS`

  Returns the number of connections on an object.

`Returns:` unsigned_long_at

`IS_TOP_FREQUENTS` (`uint` n)

Returns true if a given object is in the top n of a identifier.

`Parameters` (expressions not allowed) `:`

n- Given object must be in the top n frequents of the collected objects.

`Returns:` bool_at

`IS_TOP` (`uint` n)

Returns true if a given object is in the top n of a identifier.

`Parameters` (expressions not allowed) `:`

n- Given object must be in the top n of the collected objects.

`Returns:` bool_at

- `REQUESTS`

  Returns the number of requests on an object.

`Returns:` unsigned_long_at

- `RESPTIME`

  Returns the average response time of an object.

`Returns:` unsigned_long_at

STREAM_TRANSACTION_TRACK_MODE_E

This object provides stream analytics transaction tracking modes.

Enumerations

RESPONSE_TIME

SUBSCRIBER_T

Retrieves AVPs and other subscriber attributes from a subscriber session.

This topic lists the expressions that are provided by this class.

`AVP` (`uint` avpcode)

Returns the AVP with the given AVP code from the subscriber session.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` avp_t

`AVP` (`uint` avpcode, `uint` vendorid)

Returns the AVP with the given code and within given Vendor ID namespace from this subscriber session.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor ID

`Returns:` avp_t

`RULE_ACTIVE` (text_t rulename)

Returns true if given rulename is active for this subscriber session.

- Expression RULE_ACTIVE searches the current policies of subscriber and returns TRUE if it is present, otherwise returns FALSE.

`Parameters` (expressions not allowed) `:`

rulename- Polname

`Returns:` bool_at

- `SERVICEPATH`

  Returns the SERVICEPATH name as a string.

- Expression SERVICEPATH fetches the value in servicepathAVP for dynamic subscribers, or configured servicepath for static subscribers.
- It returns NULL if servicepathAVP is not present or servicepath is not configured.

`Returns:` servicepath_t

SYS_T

Designates an expression that refers to the ApplicationSwitch, rather than the client or server.

This topic lists the expressions that are provided by this class.

`CHECK_LIMIT` (text_t identifier_name)

Used for rate limiting. Returns a boolean Result.

`Parameters` (expressions not allowed) `:`

identifier_name- Identifier Name

`Returns:` bool_at

`CI_CALLOUT` (`ci_callout_bool` cic)

Make a Content Inspection callout. Returns a boolean result.

`Parameters` (expressions not allowed) `:`

cic- Name of Content Inspection callout that returns boolean result.

`Returns:` bool_at

`CI_CALLOUT` (`ci_callout_num` cic)

Make a Content Inspection callout. Returns a number result.

`Parameters` (expressions not allowed) `:`

cic- Name of Content Inspection callout that returns number result.

`Returns:` num_at

`CI_CALLOUT` (`ci_callout_text` cic)

Make a Content Inspection callout. Returns a text result.

`Parameters` (expressions not allowed) `:`

cic- Name of Content Inspection callout that returns text result.

`Returns:` text_t

`CLIENT_EXPR` (text_t s)

Evaluates a client expression. Returns a boolean result. Examples:

CLIENT_EXPR("client.av(Norton).exists") add some more examples

`Parameters` (expressions not allowed) `:`

s- Client Expression

`Returns:` bool_at

- `ERROR`

  Returns the error encountered when performing the last operation.

`Returns:` error_t

`HTTP_CALLOUT` (`http_callout_bool` hc)

Make a http callout. Returns a boolean result.

`Parameters` (expressions not allowed) `:`

hc- Name of Http callout that returns boolean result.

`Returns:` bool_at

`HTTP_CALLOUT` (`http_callout_num` hc)

Make a http callout. Returns a number result.

`Parameters` (expressions not allowed) `:`

hc- Name of Http callout that returns number result.

`Returns:` num_at

`HTTP_CALLOUT` (`http_callout_text` hc)

Make a http callout. Returns a text result.

`Parameters` (expressions not allowed) `:`

hc- Name of Http callout that returns text as result.

`Returns:` text_t

- `NANO_TIME`

  Returns the current system time as the number of nanoseconds since "GMT Jan 1 1970 0h 0m 0.000000000s". Accuracy may be at larger granularity than nanosecond resolution.

`Returns:` unsigned_long_at

`NON_BLOCKING_HTTP_CALLOUT` (`http_callout_bool` hc)

Make a non blocking http callout. Returns a boolean result 'true'.

`Parameters` (expressions not allowed) `:`

hc- Name of Http callout that returns boolean result that is ignored.

`Returns:` bool_at

`NON_BLOCKING_HTTP_CALLOUT` (`http_callout_num` hc)

Make a non blocking http callout. Returns a number that is '0'.

`Parameters` (expressions not allowed) `:`

hc- Name of Http callout that returns number which is ignored.

`Returns:` num_at

`NON_BLOCKING_HTTP_CALLOUT` (`http_callout_text` hc)

Make a non blocking http callout. Returns a text that is of zero length.

`Parameters` (expressions not allowed) `:`

hc- Name of Http callout that returns text as result which is ignored.

`Returns:` text_t

- `NSIP`

  Returns the netscaler's IPV4 address.

`Returns:` ip_address_at

- `RANDOM`

  Returns a random number between 0 and 1, inclusive of 0 but exclusive of 1

`Returns:` double_at

`SERVICEGROUP` (text_t servicegroup_name)

Used for Servicegroup expressions.These expression raises an undef if servicegroup with the given name doesn't exist.

`Parameters` (expressions not allowed) `:`

servicegroup_name- ServiceGroup Name

`Returns:` servicegroup_t

`SERVICE` (text_t service_name)

Used for Service expressions.These expression raises an undef if service with the given name doesn't exist.

`Parameters` (expressions not allowed) `:`

service_name- Service Name

`Returns:` service_t

- `TIME`

  Returns the current system time as the number of seconds since "GMT Jan 1 1970 0h 0m 0s". NOTE: It is not possible to set the system time to date and time before 1970.

`Returns:` time_at

- `UUID`

  Returns a newly generated UUID.

`Returns:` text_t

`VSERVER` (text_t vserver_name)

Used for vserver expressions.These expressions raise undef if virtual server with name doesn't exist.

`Parameters` (expressions not allowed) `:`

vserver_name- Virtual Server

`Returns:` vserver_t

TCP_OPTIONS_T

TCP Protocol Options

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `COUNT`

  Returns the value of number of tcp options present.

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert tcp_options_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPE_NAME` (tcp_options_type_name_e m)

Returns the value of tcp option as sequence of bytes whose type is specified as an argument.

`Parameters` (expressions not allowed) `:`

m- TCP Option Type Name

`Returns:` tcp_options_type_t

`*TYPE` (`uint` type)

Returns the value of tcp option as sequence of bytes whose type is specified as an argument.

`Parameters` (expressions not allowed) `:`

type- Type value

`Returns:` tcp_options_type_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many

other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"
```

```
    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` tcp_options_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` tcp_options_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

TCP_OPTIONS_TYPE_NAME_E

This object represents one of the TCP Options Type Name.

Enumerations

REPEATER

TIMESTAMP

SACK_PERMITTED

WINDOW

MAXSEG

TCP_OPTIONS_TYPE_T

TCP Protocol Options Type

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `EXISTS`

  Returns TRUE if an instance of the current tcp option type exists.

`Returns:` bool_at

`*OPTION_LENGTH`

Returns length of the current tcp option type in bytes This is the total length of the TCP option that got inserted in the TCP header and is not same as the string length of the option value

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert tcp_options_type_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED,

NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"
```

```
    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +
```

```
"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` tcp_options_type_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\

\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` tcp_options_type_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing

the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be

the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the

value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

TCP_REPEATER_OPTION_T

TCP Protocol Option : Repeater

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `EXISTS`

  Returns TRUE if Repeater option type exists.

`Returns:` bool_at

`*IP`

Returns IPV4 address present in the Repeater option.

`Returns:` ip_address_at

`*MAC`

Returns MAC address present in the Repeater option.

`Returns:` mac_address_at

`*OPTION_LENGTH`

Returns length of the Repeater option in bytes This is the total length of the TCP option that got inserted in the TCP header and is not same as the string length of the option value

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert tcp_repeater_option_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many

other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"
```

```
    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/ mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/ AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/ 7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </ RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` tcp_repeater_option_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` tcp_repeater_option_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

TCP_REQ_PROTOCOL_T

TCP Protocol Request

This topic lists the expressions that are provided by this class.

- `BANDWIDTH`

  Returns the bandwidth of the TCP connection.

`Returns:` num_at

- `CS_VSERVER`

  Returns the CS vserver serving the current request.

`Returns:` vserver_t

- `DSTPORT`

  Returns the ID of the current packet's destination port as a number.

`Returns:` num_at

- `LB_VSERVER`

  Returns the LB vserver serving the current request.

`Returns:` vserver_t

- `MSS`

  Returns the maximum segment size (MSS) for the current connection as a number.

`Returns:` num_at

- `OPTIONS`

  Returns the tcp options.

`Returns:` tcp_options_t

`PAYLOAD` (`uint` i)

Returns the specified portion of the TCP payload data as a string, beginning with the first character and continuing for the number of characters designated in uint.

`Parameters``:`

i- Body length

`Returns:` text_t

- `REPEATER_OPTION`

  Returns the branch repeater tcp option.

`Returns:` tcp_repeater_option_t

- `SMOOTHRTT`

  Returns the smoothed round trip time of the TCP connection.

`Returns:` num_at

- `SRCPORT`

  Returns the ID of the current packet's source port as a number.

`Returns:` num_at

TCP_RES_PROTOCOL_T

TCP Protocol Response

This topic lists the expressions that are provided by this class.

- `BANDWIDTH`

  Returns the bandwidth of the TCP connection.

`Returns:` num_at

- `DSTPORT`

  Returns the ID of the current packet's destination port as a number.

`Returns:` num_at

- `MSS`

  Returns the maximum segment size (MSS) for the current connection as a number. Note: The MSS on the server side connection is derived using internal NetScaler logic. Typically users cannot attribute any meaning to the MSS value on the server connection and should not use this expression in policies.

`Returns:` num_at

- `OPTIONS`

  Returns the tcp options.

`Returns:` tcp_options_t

`PAYLOAD` (`uint` i)

Returns the specified portion of the TCP payload data as a string, beginning with the first character and continuing for the number of characters designated in uint.

`Parameters``:`

i- Body length

`Returns:` text_t

- `SMOOTHRTT`

  Returns the smoothed round trip time of the TCP connection.

`Returns:` num_at

- `SRCPORT`

  Returns the ID of the current packet's source port as a number.

`Returns:` num_at

TCP_STATE_E

TCP states

Enumerations

CLOSED

CLOSING

CLOSE_WAIT

ESTABLISHED

FIN_WAIT_1

FIN_WAIT_2

LAST_ACK

LISTEN

SYN_RECEIVED

SYN_SENT

TIME_WAIT

NOT_APPLICABLE

This topic lists the expressions that are provided by this class.

`EQ` (tcp_state_e state)

Returns Boolean True if the TCP state matches the argument. Example: CONNECTION.TCPSTATE.EQ(ESTABLISHED)

`Parameters` (expressions not allowed) `:`

state- TCP State

`Returns:` bool_at

`NE` (tcp_state_e state)

Returns Boolean True if the TCP state do not matches the argument. Example: CONNECTION.TCPSTATE.NE(ESTABLISHED)

`Parameters` (expressions not allowed) `:`

state- TCP State

`Returns:` bool_at

TEXT_T

Designates any piece of text.

This topic lists the expressions that are provided by this class.

`AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`APPEND` (ip_address_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`APPEND` (time_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`APPEND` (unsigned_long_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

- `B64DECODE`

  Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

- `B64ENCODE`

  Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

- `BLOB_TO_HEX`

  Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

- `CRC32`

  Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

- `DECODE_USING_TEXT_MODE`

  Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

- `DECRYPT`

  Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

- `ENCRYPT`

  Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

- `GRPC`

  Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

- `HASH`

  Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

- `HTML_XML_SAFE`

  Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

- `HTTP_HEADER_SAFE`

  Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

- `HTTP_URL_SAFE`

  Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"
```

```
Open and close parentheses: "(", ")"

Semi-colon: ";"

Colon: ":"

At symbol: "@"

Question mark: "?"

Equals: "="

Dollar: "$"

Percent: "%"

Ampersand: "&"

Plus: "+"

Comma: ","

Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

- `IS_BOOL_AT`

  Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

- `IS_DOUBLE_AT`

  Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

- `IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

- `IS_IPV6_SUBNET_AT`

  Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

- `IS_IP_AT`

  Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

- `IS_MAC_ADDRESS_AT`

  Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

- `IS_NUM_AT`

  Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

- `IS_TIME_AT`

  Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

- `IS_UNSIGNED_LONG_AT`

  Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'

- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

- `LENGTH`

  Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

- `LOCATION_LONG`

  Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

- `MARK_SAFE`

  Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

- `NORMALIZE_URL`

  Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +
```

```
"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ> <InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` text_t

`SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\

\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` text_t

`SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

- `STRIP_END_WS`

  Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

- `STRIP_START_WS`

  Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

- `TO_LOWER`

  Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

- `TO_UPPER`

  Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

- `TYPECAST_AVP_T`

  Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

- `TYPECAST_AVP_UNUM_T`

  Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

- `TYPECAST_BOOL_AT`

  Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

- `TYPECAST_COOKIE_T`

  Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

- `TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

- `TYPECAST_DNS_DOMAINNAME_T`

  Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

- `TYPECAST_DNS_FLAG_T`

  Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

- `TYPECAST_DOUBLE_AT`

  Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

- `TYPECAST_HTTP_CACHE_CONTROL_T`

  Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

- `TYPECAST_HTTP_CONTENT_LENGTH_T`

  Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as

a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

- `TYPECAST_HTTP_COOKIE_T`

  Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

- `TYPECAST_HTTP_DATE_T`

  Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

- `TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

- `TYPECAST_HTTP_METHOD_T`

  Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

- `TYPECAST_HTTP_SET_COOKIE_T`

  Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

- `TYPECAST_HTTP_URL_T`

  Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

- `TYPECAST_HTTP_VERSION_T`

  Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

- `TYPECAST_IPV6_ADDRESS_AT`

  Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

- `TYPECAST_IPV6_ADDRESS_T`

  Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

- `TYPECAST_IPV6_SUBNET_AT`

  Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

- `TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

- `TYPECAST_IP_ADDRESS_AT`

  Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

- `TYPECAST_IP_ADDRESS_T`

  Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

- `TYPECAST_IP_OPTIONS_T`

  Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

- `TYPECAST_IP_OPTIONS_TYPE_T`

  Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

- `TYPECAST_IP_TOS_T`

  Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

- `TYPECAST_MAC_ADDRESS_AT`

  Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

- `TYPECAST_MAC_ADDRESS_T`

  Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

- `TYPECAST_NUM_AT`

  Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

- `TYPECAST_PROTOCOL_BUFFER_T`

  Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

- `TYPECAST_RADIUS_AVP_T`

  Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

- `TYPECAST_RADIUS_AVP_VALUE_T`

  Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

- `TYPECAST_SEQ_TEXT_T`

  Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

- `TYPECAST_SERVICEPATH_T`

  Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

- `TYPECAST_SIP_CALLID_HEADER_T`

  Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

- `TYPECAST_SIP_CONTENT_LENGTH_T`

  Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

- `TYPECAST_SIP_FROM_HEADER_T`

  Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

- `TYPECAST_SIP_HOSTNAME_T`

  Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

- `TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

- `TYPECAST_SIP_TO_HEADER_T`

  Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

- `TYPECAST_SIP_URL_T`

  Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

- `TYPECAST_SIP_VERSION_T`

  Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

- `TYPECAST_SIP_VIA_HEADER_T`

  Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

- `TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

- `TYPECAST_TCP_OPTIONS_T`

  Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

- `TYPECAST_TCP_OPTIONS_TYPE_T`

  Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

- `TYPECAST_TCP_REPEATER_OPTION_T`

  Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

- `TYPECAST_TIME_AT`

  Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

- `TYPECAST_TIME_LOCAL_AT`

  Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

- `TYPECAST_TIME_T`

  Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

- `TYPECAST_UNSIGNED_LONG_AT`

  Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

- `TYPECAST_UNUM_TEXT_T`

  Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

- `TYPECAST_URL_CATEGORY_T`

  Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

- `TYPECAST_VENDOR_SPEC_APPID_AVP_T`

  Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

- `TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

  Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

- `URL_RESERVED_CHARS_SAFE`

  Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

  ```
  Based on RFC3986, following are considered URL unreserved characters:

      Alpha-numeric characters: a-z, A-Z, 0-9

      Hyphen and underscore: "-", "_"

      Dot: "."

      Tilde: "~"
  ```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
```

```
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
```

```
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

TEXTMODE_E

Text Mode Enum

Enumerations

IGNORECASE

NOIGNORECASE

URLENCODED

NOURLENCODED

PLUS_AS_SPACE

NO_PLUS_AS_SPACE

BACKSLASH_ENCODED

NO_BACKSLASH_ENCODED

BAD_ENCODE_RAISE_UNDEF

NO_BAD_ENCODE_RAISE_UNDEF

THIS_T

This is a special marker class.If the return type of a method is this_t then the current context's type does not change.

TIME_AT

Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from num_at

`APPEND` (text_t str)

Appends the given string to the string representation of the current time value.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*BETWEEN` (time_at time1, time_at time2)

Results in a Boolean TRUE value if the time value is between the Lower and the Upper time arguments. Both the Lower and the Upper time arguments must be fully specified.

For example - GMT 1995 Jan is fully specified. But GMT Jan or GMT 1995 20 or GMT Jan Mon_2 are not fully specified. The Upper and Lower arguments must be both GMT or both Local. The day of the week must not be present in either the Lower or the Upper argument. It is OK to specify the day of the month as the 1st, 2nd, 3rd or 4th weekday of the month (example Wed_3 is the 3rd Wednesday of the month). The Upper Time argument must be bigger than the Lower Time argument.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005. BETWEEN(GMT 2004, GMT 2006): TRUE BETWEEN(GMT 2004 Jan, GMT 2006 Nov): TRUE BETWEEN(GMT 2004 Jan, GMT 2006): TRUE BETWEEN(GMT 2005 May Sun_1, GMT 2005 May Sun_3): TRUE BETWEEN(GMT 2005 May 1, GMT May 2005 1): TRUE BETWEEN(LOCAL 2005 May 1, LOCAL May 2005 1): Answer depends on the NetScaler system's timezone.

`Parameters` (expressions not allowed) `:`

time1- Lower Time

time2- Upper Time

`Returns:` bool_at

`*BETWEEN` (time_at time1, time_at time2)

Returns Boolean TRUE if the time value is greater than or equal to the Lower argument and the time value is lesser than or equal to the Upper argument.

`Parameters``:`

time1- Lower GMT Time Value

time2- Upper GMT Time Value

`Returns:` bool_at

`*DAY`

Extracts the day of the month from the current system time, and returns that value as a number from 1 through 31 representing that day.

`Returns:` num_at

`*EQ` (time_at t)

Results in Boolean TRUE value if the time value is equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

EQ(GMT 2005): TRUE EQ(GMT 2005 Dec): FALSE EQ(Local 2005 May): TRUE or FALSE depending on the current timezone. EQ(GMT 10h): TRUE EQ(GMT 10h 30s): TRUE EQ(GMT May 10h): TRUE EQ(GMT Sun): TRUE EQ(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed)`:`

t- Time

`Returns:` bool_at

`*EQ` (time_at t)

Results in Boolean TRUE value if the time value is equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*GE` (time_at t)

Results in Boolean TRUE value if the time value is greater than or equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

GE(GMT 2004): TRUE GE(GMT 2005 Jan): TRUE GE(Local 2005 May): TRUE or FALSE depending on the current timezone. GE(GMT 8h): TRUE GE(GMT 30m): FALSE GE(GMT May 10h): TRUE GE(GMT May 10h 0m): TRUE GE(GMT Sun): TRUE GE(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*GE` (time_at t)

Results in Boolean TRUE value if the time value is greater than or equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*GT` (time_at t)

Results in Boolean TRUE value if the time value is greater than the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

GT(GMT 2004): TRUE GT(GMT 2005 Jan): TRUE GT(Local 2005 May): TRUE or FALSE depending on the current timezone. GT(GMT 8h): TRUE GT(GMT 30m): FALSE GT(GMT May 10h): FALSE GT(GMT May 10h 0m): TRUE GT(GMT Sun): FALSE GT(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*GT` (time_at t)

Results in Boolean TRUE value if the time value is greater than the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*HOURS`

Extracts the hour from the current system time, and returns that value as an integer from 0 to 23.

`Returns:` num_at

`*LE` (time_at t)

Results in Boolean TRUE value if the time value is lesser than or equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

LE(GMT 2006): TRUE LE(GMT 2005 Dec): TRUE LE(Local 2005 May): TRUE or FALSE depending on the current timezone. LE(GMT 8h): FALSE LE(GMT 30m): TRUE LE(GMT May 10h): TRUE LE(GMT Jun 11h): TRUE LE(GMT Wed): TRUE LE(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*LE` (time_at t)

Results in Boolean TRUE value if the time value is less than or equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*LT` (time_at t)

Results in Boolean TRUE value if the time value is lesser than the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

LT(GMT 2006): TRUE LT(GMT 2005 Dec): TRUE LT(Local 2005 May): TRUE or FALSE depending on the current timezone. LT(GMT 8h): FALSE LT(GMT 30m): TRUE LT(GMT May 10h): FALSE LT(GMT Jun 11h): TRUE LT(GMT Wed): TRUE LT(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*LT` (time_at t)

Results in Boolean TRUE value if the time value is less than the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*MINUTES`

Extracts the minute from the current system time, and returns that value as an integer from 0 to 59.

`Returns:` num_at

`*MONTH`

Extracts the month from the current system time, and returns that value as an integer from 1 (January) to 12 (December).

`Returns:` num_at

`*NE` (time_at t)

Results in Boolean TRUE value if the time value is not equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

NE(GMT 2005): FALSE NE(GMT 2005 Dec): TRUE NE(Local 2005 May): TRUE or FALSE depending on the current timezone. NE(GMT 10h): FALSE NE(GMT 10h 30s): FALSE NE(GMT May 10h): FALSE NE(GMT Sun): FALSE NE(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*NE` (time_at t)

Results in Boolean TRUE value if the time value is not equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*RELATIVE_BOOT`

Calculates the number of seconds to the closest previous or scheduled reboot, and returns an integer. If the closest boot time is in the past, the integer is negative; if it is in the future, the integer is positive.

`Returns:` num_at

`*RELATIVE_NOW`

Calculates the number of seconds between the current system time and the specified time, and returns an integer showing that number. If the designated time is in the past, the integer is negative; if it is in the future, the integer is positive.

`Returns:` num_at

`*SECONDS`

Extracts the seconds from the current system time, and returns that value as an integer from 0 to 59.

`Returns:` num_at

`*TO_LOCAL`

Convert the time to the local time zone

`Returns:` time_local_at

`*TYPECAST_NUM_AT`

Convert time_at to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_TEXT_T`

Typecast the Time Value to its string representation.

`Returns:` text_t

`*WEEKDAY`

Results in a Number Value between 0 (Sunday) and 6 (Saturday) which gives the week day in the time value.

`Returns:` num_at

`*WITHIN` (time_at time1, time_at time2)

Results in a Boolean TRUE value if the time value lies within all the ranges defined by the Lower and Upper time arguments.

If an element of time like day or hour is left unspecified in the Lower argument then it is assumed to have the lowest value of its range. If an element is left unspecified in the Upper argument then it is assumed to have the highest value of its range. If the year is specified in one of the argument then it must be specified in the other argument as well. The ranges for different elements of time are month 1-12, day 1-31, weekday 0-6, hour 0-23, minutes 0-59 and seconds 0-59. Each element of time defines a range. For the result to be TRUE each element of time in the time value must lie in the corresponding range present in the Lower and Upper arguments.

Assume the time value is GMT 2005 May 10 10h 15m 30s. This is the second Tuesday of the month. WITHIN(GMT 2004, GMT 2006): TRUE WITHIN(GMT 2004 Jan, GMT 2006 Mar): FALSE (May doesn't fall in the Jan-Mar range.) WITHIN(GMT Feb, GMT): TRUE (May falls in the Feb-Dec

range.) WITHIN(GMT Sun_1, GMT Sun_3): TRUE (2nd Tuesday lies within 1st Sunday and the 3rd Sunday.) WITHIN(GMT 2005 May 1 10h, GMT May 2005 1 17h): TRUE WITHIN(LOCAL 2005 May 1, LOCAL May 2005 1): Answer depends on the NetScaler system's timezone.

`Parameters` (expressions not allowed) `:`

time1- Lower Time

time2- Upper Time

`Returns:` bool_at

`*YEAR`

Extracts the year from the current system time, and returns that value as a four-digit integer.

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

TIME_LOCAL_AT

Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from num_at

`APPEND` (text_t str)

Appends the given string to the string representation of the local time value.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*BETWEEN` (time_local_at time1, time_local_at time2)

Returns Boolean TRUE if the time value is greater than or equal to the Lower argument and the time value is lesser than or equal to the Upper argument.

`Parameters``:`

time1- Lower Local Time

time2- Upper Local Time

`Returns:` bool_at

`*DAY`

Extracts the day of the month from the local time, and returns that value as a number from 1 through 31 representing that day.

`Returns:` num_at

`*EQ` (time_local_at t)

Results in Boolean TRUE value if the time value is equal to the argument Local time value.

`Parameters``:`

t- Local Time

`Returns:` bool_at

`*GE` (time_local_at t)

Results in Boolean TRUE value if the time value is greater than or equal to the argument Local time value.

`Parameters``:`

t- Local Time

`Returns:` bool_at

`*GT` (time_local_at t)

Results in Boolean TRUE value if the time value is greater than the argument Local time value.

`Parameters``:`

t- Local Time

`Returns:` bool_at

`*HOURS`

Extracts the hour from the local time, and returns that value as an integer from 0 to 23.

`Returns:` num_at

`*LE` (time_local_at t)

Results in Boolean TRUE value if the time value is less than or equal to the argument Local time value.

`Parameters``:`

t- Local Time

`Returns:` bool_at

`*LT` (time_local_at t)

Results in Boolean TRUE value if the time value is less than the argument Local time value.

`Parameters``:`

t- Local Time

`Returns:` bool_at

`*MINUTES`

Extracts the minute from the local time, and returns that value as an integer from 0 to 59.

`Returns:` num_at

`*MONTH`

Extracts the month from the local time, and returns that value as an integer from 1 (January) to 12 (December).

`Returns:` num_at

`*NE` (time_local_at t)

Results in Boolean TRUE value if the time value is not equal to the argument Local time value.

`Parameters``:`

t- Local Time

`Returns:` bool_at

`*SECONDS`

Extracts the seconds from the local time, and returns that value as an integer from 0 to 59.

`Returns:` num_at

`*TO_GMT`

Generate the GMT time from the local time.

`Returns:` time_at

`*TYPECAST_NUM_AT`

Convert time_local_at to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_TEXT_T`

Typecast the Local time value to its string representation.

`Returns:` text_t

`*WEEKDAY`

Results in a Number Value between 0 (Sunday) and 6 (Saturday) which gives the week day in the time value.

`Returns:` num_at

`*YEAR`

Extracts the year from the local time, and returns that value as a four-digit integer.

`Returns:` num_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_TIME_AT`

Typecast the Number Value to a Time value.

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

TIME_T

This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t time_at

- `TYPECAST_NUM_AT`

  Convert time_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_TEXT_T`

Convert time_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert time_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*ABS`

Return the absolute value of the number.

`Returns:` num_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Number Value after adding the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current time value.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the number value is greater than or equal to the Lower argument and the number value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (time_at time1, time_at time2)

Results in a Boolean TRUE value if the time value is between the Lower and the Upper time arguments. Both the Lower and the Upper time arguments must be fully specified.

For example - GMT 1995 Jan is fully specified. But GMT Jan or GMT 1995 20 or GMT Jan Mon_2 are not fully specified. The Upper and Lower arguments must be both GMT or both Local. The day of the week must not be present in either the Lower or the Upper argument. It is OK to specify the day of the month as the 1st, 2nd, 3rd or 4th weekday of the month (example Wed_3 is the 3rd Wednesday of the month). The Upper Time argument must be bigger than the Lower Time argument.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005. BETWEEN(GMT 2004, GMT 2006): TRUE BETWEEN(GMT 2004 Jan, GMT 2006 Nov): TRUE BETWEEN(GMT 2004 Jan, GMT 2006): TRUE BETWEEN(GMT 2005 May Sun_1, GMT 2005 May Sun_3): TRUE BETWEEN(GMT 2005 May 1, GMT May 2005 1): TRUE BETWEEN(LOCAL 2005 May 1, LOCAL May 2005 1): Answer depends on the NetScaler system's timezone.

`Parameters` (expressions not allowed) `:`

time1- Lower Time

time2- Upper Time

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at time1, time_at time2)

Returns Boolean TRUE if the time value is greater than or equal to the Lower argument and the time value is lesser than or equal to the Upper argument.

`Parameters``:`

time1- Lower GMT Time Value

time2- Upper GMT Time Value

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Number Value after bitwise ANDing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Number Value after bitwise negating the current number value.

`Returns:` num_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Number Value after bitwise ORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Number Value after bitwise XORing the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DAY`

Extracts the day of the month from the current system time, and returns that value as a number from 1 through 31 representing that day.

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Number Value after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the number value is equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (time_at t)

Results in Boolean TRUE value if the time value is equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

EQ(GMT 2005): TRUE EQ(GMT 2005 Dec): FALSE EQ(Local 2005 May): TRUE or FALSE depending on the current timezone. EQ(GMT 10h): TRUE EQ(GMT 10h 30s): TRUE EQ(GMT May 10h): TRUE EQ(GMT Sun): TRUE EQ(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed)`:`

t- Time

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at t)

Results in Boolean TRUE value if the time value is equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the number value is greater than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (time_at t)

Results in Boolean TRUE value if the time value is greater than or equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

GE(GMT 2004): TRUE GE(GMT 2005 Jan): TRUE GE(Local 2005 May): TRUE or FALSE depending on the current timezone. GE(GMT 8h): TRUE GE(GMT 30m): FALSE GE(GMT May 10h): TRUE GE(GMT May 10h 0m): TRUE GE(GMT Sun): TRUE GE(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at t)

Results in Boolean TRUE value if the time value is greater than or equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the number value is greater than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (time_at t)

Results in Boolean TRUE value if the time value is greater than the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

GT(GMT 2004): TRUE GT(GMT 2005 Jan): TRUE GT(Local 2005 May): TRUE or FALSE depending on the current timezone. GT(GMT 8h): TRUE GT(GMT 30m): FALSE GT(GMT May 10h): FALSE GT(GMT May 10h 0m): TRUE GT(GMT Sun): FALSE GT(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at t)

Results in Boolean TRUE value if the time value is greater than the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HOURS`

Extracts the hour from the current system time, and returns that value as an integer from 0 to 23.

`Returns:` num_at

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"
```

```
    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the number value is lesser than or equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (time_at t)

Results in Boolean TRUE value if the time value is lesser than or equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

LE(GMT 2006): TRUE LE(GMT 2005 Dec): TRUE LE(Local 2005 May): TRUE or FALSE depending on the current timezone. LE(GMT 8h): FALSE LE(GMT 30m): TRUE LE(GMT May 10h): TRUE LE(GMT Jun 11h): TRUE LE(GMT Wed): TRUE LE(GMT May Sun_1): TRUE

`Parameters` (expressions not allowed)`:`

t- Time

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at t)

Results in Boolean TRUE value if the time value is less than or equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Number Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.LSHIFT(1) = HTTP.REQ.URL.LENGTH.LSHIFT(33) = 8, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Left Shift Length

`Returns:` num_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the number value is lesser than the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (time_at t)

Results in Boolean TRUE value if the time value is lesser than the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

LT(GMT 2006): TRUE LT(GMT 2005 Dec): TRUE LT(Local 2005 May): TRUE or FALSE depending on the current timezone. LT(GMT 8h): FALSE LT(GMT 30m): TRUE LT(GMT May 10h): FALSE LT(GMT Jun 11h): TRUE LT(GMT Wed): TRUE LT(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at t)

Results in Boolean TRUE value if the time value is less than the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".

- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MINUTES`

Extracts the minute from the current system time, and returns that value as an integer from 0 to 59.

`Returns:` num_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum value after comparing the argument with the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Number Value that is the renaminder after dividing the current number value by the argument.

`Parameters``:`

i- Number

`Returns:` num_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MONTH`

Extracts the month from the current system time, and returns that value as an integer from 1 (January) to 12 (December).

`Returns:` num_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Number Value after multiplying the argument to the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Number Value after negating the current number value.

`Returns:` num_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the number value is not equal to the argument.

`Parameters``:`

i- Number

`Returns:` bool_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (time_at t)

Results in Boolean TRUE value if the time value is not equal to the argument time.

Assume the current time value is GMT 2005 May 1 10h 15m 30s. This is the 1st Sunday of the month of May in 2005.

NE(GMT 2005): FALSE NE(GMT 2005 Dec): TRUE NE(Local 2005 May): TRUE or FALSE depending on the current timezone. NE(GMT 10h): FALSE NE(GMT 10h 30s): FALSE NE(GMT May 10h): FALSE NE(GMT Sun): FALSE NE(GMT May Sun_1): FALSE

`Parameters` (expressions not allowed) `:`

t- Time

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at t)

Results in Boolean TRUE value if the time value is not equal to the argument GMT time value.

`Parameters``:`

t- GMT Time Value

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +
```

```
"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB

- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*RELATIVE_BOOT`

Calculates the number of seconds to the closest previous or scheduled reboot, and returns an integer. If the closest boot time is in the past, the integer is negative; if it is in the future, the integer is positive.

`Returns:` num_at

`*RELATIVE_NOW`

Calculates the number of seconds between the current system time and the specified time, and returns an integer showing that number. If the designated time is in the past, the integer is negative; if it is in the future, the integer is positive.

`Returns:` num_at

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Number Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 32. For example, let HTTP.REQ.URL.LENGTH be 4. Then, HTTP.REQ.URL.LENGTH.RSHIFT(1) = HTTP.REQ.URL.LENGTH.RSHIFT(33) = 2, since 33 on division by 32 yields a remainder of 1.

`Parameters``:`

i- Right Shift Length

`Returns:` num_at

`*SECONDS`

Extracts the seconds from the current system time, and returns that value as an integer from 0 to 59.

`Returns:` num_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` time_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the

character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` time_t

`*SIGNED16_STRING` (endian_e endianness)

Create a signed 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED32_STRING` (endian_e endianness)

Create a signed 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*SIGNED8_STRING`

Create a signed 8-bit binary string from the number.

`Returns:` text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Number Value after subtracting the argument from the current number value.

`Parameters``:`

i- Number

`Returns:` num_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOCAL`

Convert the time to the local time zone

`Returns:` time_local_at

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Number Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the

beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the

current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses,

A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Typecast the Number Value to an IP Address value.

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_LOCAL_AT`

Typecast the Number Value to a local time value.

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Number Value to a Unsigned Long value.

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL

and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*WEEKDAY`

Results in a Number Value between 0 (Sunday) and 6 (Saturday) which gives the week day in the time value.

`Returns:` num_at

`*WEEKDAY_STRING`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the long form of the string name for that day, e.g. 0 = "Sunday", 6 = "Saturday".

`Returns:` text_t

`*WEEKDAY_STRING_SHORT`

Given the numeric day of the week, e.g. SYS.TIME.WEEKDAY, return the short form of the string name for that day, e.g. 0 = "Sun", 6 = "Sat".

`Returns:` text_t

`*WITHIN` (time_at time1, time_at time2)

Results in a Boolean TRUE value if the time value lies within all the ranges defined by the Lower and Upper time arguments.

If an element of time like day or hour is left unspecified in the Lower argument then it is assumed to have the lowest value of its range. If an element is left unspecified in the Upper argument then it is assumed to have the highest value of its range. If the year is specified in one of the argument then it must be specified in the other argument as well. The ranges for different elements of time are month 1-12, day 1-31, weekday 0-6, hour 0-23, minutes 0-59 and seconds 0-59. Each element of time defines a range. For the result to be TRUE each element of time in the time value must lie in the corresponding range present in the Lower and Upper arguments.

Assume the time value is GMT 2005 May 10 10h 15m 30s. This is the second Tuesday of the month. WITHIN(GMT 2004, GMT 2006): TRUE WITHIN(GMT 2004 Jan, GMT 2006 Mar): FALSE (May doesn't fall in the Jan-Mar range.) WITHIN(GMT Feb, GMT): TRUE (May falls in the Feb-Dec range.) WITHIN(GMT Sun_1, GMT Sun_3): TRUE (2nd Tuesday lies within 1st Sunday and the 3rd Sunday.) WITHIN(GMT 2005 May 1 10h, GMT May 2005 1 17h): TRUE WITHIN(LOCAL 2005 May 1, LOCAL May 2005 1): Answer depends on the NetScaler system's timezone.

`Parameters` (expressions not allowed) `:`

time1- Lower Time

time2- Upper Time

`Returns:` bool_at

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
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        {
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            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
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&lt;/Books>
```

```
{
    "Books":
    \[
        {
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            "title": "Paradise Lost",
            "price": 16.99
        },
        {
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            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
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        &lt;price>16.99&lt;/price>
    &lt;/Val>
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        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
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```

```
{
    "Books":
    \[
        {
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            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

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        &lt;price>16.99&lt;/price>

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    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

TRAFFIC_DOMAIN_REQ_T

TRAFFIC_DOMAIN Request

This topic lists the expressions that are provided by this class.

- `ID`

  Returns Traffic Domain Identifier through which the current packet entered the Application Switch as a number.

`Returns:` num_at

UDP_DNS_REQ_PROTOCOL_T

DNS Protocol

This topic lists the expressions that are provided by this class.

- `DOMAIN`

  Returns domain name. Sets the text mode to case insensitive.

`Returns:` dns_domainname_t

- `IS_AAAAREC`

  Returns TRUE if it is of AAAA record type.

`Returns:` bool_at

- `IS_ANYREC`

  Returns TRUE if it is of ANY record type.

`Returns:` bool_at

- `IS_AREC`

  Returns TRUE if it is of A record type.

`Returns:` bool_at

- `IS_CNAMEREC`

  Returns TRUE if it is of CNAME record type.

`Returns:` bool_at

- `IS_MXREC`

  Returns TRUE if it is of MX record type.

`Returns:` bool_at

- `IS_NAPTRREC`

  Returns TRUE if it is of NAPTR record type.

`Returns:` bool_at

- `IS_NSREC`

  Returns TRUE if it is of NS record type.

`Returns:` bool_at

- `IS_PTRREC`

  Returns TRUE if it is of PTR record type.

`Returns:` bool_at

- `IS_SOAREC`

  Returns TRUE if it is of SOA record type.

`Returns:` bool_at

- `IS_SRVREC`

  Returns TRUE if it is of SRV record type.

`Returns:` bool_at

UDP_REQ_PROTOCOL_T

UDP Protocol

This topic lists the expressions that are provided by this class.

- `CS_VSERVER`

  Returns the CS vserver serving the current request.

`Returns:` vserver_t

- `DNS`

  Returns DNS data for the current packet's UDP source port.

`Returns:` udp_dns_req_protocol_t

- `DSTPORT`

  Returns the ID of the current packet's UDP destination port as a number.

`Returns:` num_at

- `LB_VSERVER`

  Returns the LB vserver serving the current request.

`Returns:` vserver_t

- `RADIUS`

  Returns RADIUS data for the current packet

`Returns:` radius_protocol_t

- `SRCPORT`

  Returns the ID of the current packet's UDP source port as a number.

`Returns:` num_at

UNSIGNED_LONG_AT

Unsigned Long(64bit) Value

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from

`ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*APPEND` (text_t str)

Appends the given string to the string representation of the current unsigned long.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Unsigned Long Value after bitwise negating the current unsigned long value.

`Returns:` unsigned_long_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LSHIFT` (`uint` i)

Return the Unsigned Long Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 64.

`Parameters``:`

i- Left Shift Length

`Returns:` unsigned_long_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*RSHIFT` (`uint` i)

Return the Unsigned Long Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 64.

`Parameters``:`

i- Right Shift Length

`Returns:` unsigned_long_at

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*TYPECAST_DOUBLE_AT`

Typecast the Unsigned Long Value to a Double value.

`Returns:` double_at

`*TYPECAST_NUM_AT`

Typecast the Unsigned Long Value to a Number value.

`Returns:` num_at

`*TYPECAST_TEXT_T`

Typecast the Unsigned Long Value to its string representation.

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*ABS`

Return absolute double value of the double value.

`Returns:` double_at

`*NEG`

Return the Double Value after negating the current double value.

`Returns:` double_at

`*TYPECAST_UNSIGNED_LONG_AT`

Typecast the Double Value to a Unsigned Long value.

`Returns:` unsigned_long_at

UNSIGNED_LONG_FORMAT_E

Unsigned Long Format Enum

Enumerations

DECIMAL

Decimal representation of a positive or a negative integer. White spaces before and after the number are OK

HEX

Hexadecimal representation of a positive or a negative integer. White spaces before and after the number are OK

DECIMAL_PREFIX

Decimal representation of a positive or a negative integer followed by arbitrary characters Examples " -123" " 234 " "- 123abc" "234 abc"

HEX_PREFIX

Hexadecimal representation of a positive integer followed by arbitrary characters Examples "f" "fxyz" " f ff" all represent the number 15.

UNSIGNED_LONG_T

Provides operations to treat the underlying text as a Unsigned Long either in the DECIMAL or the HEX format.

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t unsigned_long_at

- `TYPECAST_TEXT_T`

  Convert unsigned_long_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert unsigned_long_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*ABS`

Return absolute double value of the double value.

`Returns:` double_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current unsigned long.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Unsigned Long Value after bitwise negating the current unsigned long value.

`Returns:` unsigned_long_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"
```

```
    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Unsigned Long Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 64.

`Parameters``:`

i- Left Shift Length

`Returns:` unsigned_long_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Double Value after negating the current double value.

`Returns:` double_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74A
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Unsigned Long Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 64.

`Parameters``:`

i- Right Shift Length

`Returns:` unsigned_long_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` unsigned_long_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` unsigned_long_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code

258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Unsigned Long Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the

remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the

current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses,

A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Typecast the Unsigned Long Value to a Number value.

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",
```

```
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
```

```
&lt;/Books>
```

```
{

    "author": "Milton, John",

    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
```

```
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

UNUM_TEXT_T

Provides operations to treat the underlying OctectString as Binary String or unsigned long value .

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t unsigned_long_at

- `TYPECAST_TEXT_T`

  Convert unum_text_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert unum_text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*ABS`

Return absolute double value of the double value.

`Returns:` double_at

`*ADD` (double_at i)

Return the Double Value after adding the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*ADD` (ip_address_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (num_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_local_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (time_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ADD` (unsigned_long_at i)

Return the Unsigned Long after adding the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the string representation of the current unsigned long.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AS_MICROSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.ffffff GMT ffffff represents microseconds Examples:

Mon, 05 Mar 2018 10:23:36.568419 GMT

`Returns:` text_t

`*AS_MILLISEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fff GMT fff represents milliseconds Examples:

Mon, 05 Mar 2018 10:23:36.568 GMT

`Returns:` text_t

`*AS_NANOSEC_STR`

Returns the current system time in the following format Format: Wday, day Month year hh:mm:ss.fffffffff GMT fffffffff represents nanoseconds Accuracy may be at larger granularity than nanosecond resolution. Examples:

Mon, 05 Mar 2018 10:23:36.568419567 GMT

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BETWEEN` (double_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, ip_address_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, num_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_local_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, time_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (double_at i, unsigned_long_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (ip_address_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (num_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_local_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (time_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, double_at j)

Returns Boolean TRUE if the double value is greater than or equal to the Lower argument and the double value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, ip_address_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, num_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_local_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, time_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BETWEEN` (unsigned_long_at i, unsigned_long_at j)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the Lower argument and the unsigned long value is lesser than or equal to the Upper argument.

`Parameters``:`

i- Lower

j- Upper

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BITAND` (ip_address_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (num_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_local_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (time_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITAND` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ANDing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITNEG`

Return the Unsigned Long Value after bitwise negating the current unsigned long value.

`Returns:` unsigned_long_at

`*BITOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (num_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_local_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (time_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise ORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (ip_address_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (num_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_local_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (time_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BITXOR` (unsigned_long_at i)

Return the Unsigned Long Value after bitwise XORing the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*DIV` (double_at i)

Return the Double Value after dividing the current double value by the argument.

`Parameters``:`

i- Double

`Returns:` double_at

`*DIV` (ip_address_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (num_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_local_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (time_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*DIV` (unsigned_long_at i)

Return the Unsigned Long Value after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EQ` (double_at i)

Returns Boolean TRUE if the double value is equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*EQ` (ip_address_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (num_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_local_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (time_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*EQ` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long is equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GE` (double_at i)

Returns Boolean TRUE if the double value is greater than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (num_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GT` (double_at i)

Returns Boolean TRUE if the double value is greater than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*GT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (num_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (time_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*GT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is greater than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"
```

```
    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LE` (double_at i)

Returns Boolean TRUE if the double value is lesser than or equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (num_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than or equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LSHIFT` (`uint` i)

Return the Unsigned Long Value after bitwise left shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 64.

`Parameters``:`

i- Left Shift Length

`Returns:` unsigned_long_at

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LT` (double_at i)

Returns Boolean TRUE if the double value is lesser than the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*LT` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (num_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (time_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*LT` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is lesser than the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MAX` (double_at i)

Return the maximum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MAX` (ip_address_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (num_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_local_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (time_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MAX` (unsigned_long_at i)

Return the maximum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (double_at i)

Return the minimum double value after comparing the argument with the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MIN` (ip_address_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (num_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_local_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (time_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MIN` (unsigned_long_at i)

Return the minimum unsigned long value after comparing the argument value to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (ip_address_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (num_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_local_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (time_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MOD` (unsigned_long_at i)

Return the Unsigned Long Value that is the renaminder after dividing the current unsigned long value by the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (double_at i)

Return the Double Value after multiplying the argument to the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*MUL` (ip_address_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (num_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_local_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (time_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*MUL` (unsigned_long_at i)

Return the Unsigned Long Value after multiplying the argument to the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*NEG`

Return the Double Value after negating the current double value.

`Returns:` double_at

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NE` (double_at i)

Returns Boolean TRUE if the double value is not equal to the argument.

`Parameters``:`

i- Double

`Returns:` bool_at

`*NE` (ip_address_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (num_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_local_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (time_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NE` (unsigned_long_at i)

Returns Boolean TRUE if the unsigned long value is not equal to the argument.

`Parameters``:`

i- Unsigned Long

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*RSHIFT` (`uint` i)

Return the Unsigned Long Value after bitwise right shifting the current number value by the argument number of bits. Note that the number of bits shifted is i modulo 64.

`Parameters``:`

i- Right Shift Length

`Returns:` unsigned_long_at

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` unum_text_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` unum_text_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUB` (double_at i)

Return the Double Value after subtracting the argument from the current double value.

`Parameters``:`

i- Double

`Returns:` double_at

`*SUB` (ip_address_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (num_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_local_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (time_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUB` (unsigned_long_at i)

Return the Unsigned Long Value after subtracting the argument from the current unsigned long value.

`Parameters``:`

i- Unsigned Long

`Returns:` unsigned_long_at

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code

258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Typecast the Unsigned Long Value to a Double value.

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the

remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the

current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses,

A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Typecast the Unsigned Long Value to a Number value.

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*UNSIGNED16_STRING` (endian_e endianness)

Create an unsigned 16-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED32_STRING` (endian_e endianness)

Create an unsigned 32-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED64_STRING` (endian_e endianness)

Create an unsigned 64-bit binary string from the number.

`Parameters` (expressions not allowed) `:`

endianness- Select little or big endian

`Returns:` text_t

`*UNSIGNED8_STRING`

Create an unsigned 8-bit binary string from the number.

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",
```

```
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
```

```
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
```

```
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

URL_CATEGORY_T

Retrieves URL category and attributes from an URL

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from text_t

- `CATEGORY`

  Returns the category string of the URL. If the URL does not have a category, or if the URL is malformed, this value will be "Uncategorized".

`Returns:` text_t

`*GROUP`

Returns the category group of the URL. This is a higher level grouping of various category strings. If the URL does not have a category, or if the URL is malformed, this value will be "Uncategorized".

`Returns:` text_t

`*REPUTATION`

Returns the reputation score of the URL. Where a score 5 is most risky and 1 is least risky. If the URL does not have a category, or if the URL is malformed, this value will be -1.

`Returns:` num_t

`*TYPECAST_TEXT_T`

Convert url_category_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within

the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"
```

```
    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'

- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Results in a Number Value that is the number of characters (not bytes) in the Text object.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +
```

```
"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB

- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` url_category_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out

after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\\72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\\b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` url_category_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).

- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX,

DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",
```

```
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
```

```
},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>
```

```
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
```

```
        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

VENDOR_SPEC_APPID_AVP_T

Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from avp_t

- `ACCT_APPLICATION_ID`

  Returns the Acct-Application-Id AVP (code 259) that is nested inside the Vendor_Specific_Application_Id AVP. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

`*AUTH_APPLICATION_ID`

Returns the Auth-Application-Id AVP (code 258) that is nested inside the Vendor_Specific_Application_Id AVP. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

`*TYPECAST_AVP_T`

Convert vendor_spec_appid_avp_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).
- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*VENDORID`

Returns the Vendor-Id AVP (code 266) that is nested inside the Vendor_Specific_Application_Id AVP. `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` avp_unum_t

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AVPLIST_AFTER`

Returns the region after this AVP in diameter message (or in other words returns location at end of this AVP and length covering end of this AVP to end of diameter message. If this AVP is inside a Grouped AVP, this method returns region after this AVP in parent Grouped AVP.

`Returns:` text_t

`*AVPLIST_BEFORE`

Returns the region till this AVP in diameter message (or in other words returns location at start of AVPs and length equal to offset of this AVP). If this AVP is inside a Grouped AVP, this method returns region till this AVP in parent AVP.

`Returns:` text_t

`*AVP` (`uint` avpcode)

Returns the AVP nested inside the GROUPED AVP (the Data field is a sequence of AVPs).

For example, to retrieve AVP(263) that is nested in AVP(99999) in a request, the expression is: DIAMETER.REQ.AVP(999999).AVP(263).

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

`Returns:` avp_t

`*AVP` (`uint` avpcode, `uint` vendorid)

Returns the specified AVP in given vendor-id namespace and that is nested inside a GROUPED AVP in the message.

For example, to get the AVP with code 1005 and VendorId 10415 from a Request, that is nested inside 1001 (vendor-id 10415). Use this expression: DIAMETER.REQ.AVP(1001, 10415).AVP(1004, 10415).

`Note:` To get AVP that is nested inside a grouped AVP, use the AVP method from the avp_t class.

`Parameters` (expressions not allowed) `:`

avpcode- AVP code

vendorid- Vendor Id

`Returns:` avp_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound

to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*COUNT`

Returns the number of occurences of an AVP in diameter message. The system does not keep track of more than 16 AVP occurences of an AVP. The result will be undefined if there are more than 16 instances of that AVP.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns true if the AVP exists in the message.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed) `:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."
```

```
    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"

    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` instanceno)

Returns instances of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: DIAMETER.REQ.AVP(266). However, subsequent instances must be retrieved using this method.

INSTANCE(0) retrieves the first instance, INSTANCE(1) retrieves the second instance, and so on.

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the second instance, the expression would be: DIAMETER.REQ.AVP(282).INSTANCE(1).

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` avp_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_MANDATORY`

Returns true if the AVP has the Mandatory bit set.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_VENDOR_SPECIFIC`

Returns true if the AVP has Vendor-Specific bit (V) set.

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Returns the AVP length including AVP header.

If the AVP is not present, it returns length 0. If multiple occurences of the AVP exist, it returns the length of first occurence.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +
```

```
"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw=="
<DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)
- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB

- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` vendor_spec_appid_avp_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out

after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` vendor_spec_appid_avp_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a

number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL

and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_T`

Convert text_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert avp_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests: DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses: DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE`

Returns the value of first instance of the AVP as OctetString..

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the first instance, the expression would be: DIAMETER.REQ.AVP(282).VALUE.

Alternatively, you can use the expression: DIAMETER.REQ.AVP(282).

`Returns:` text_t

`*VALUE` (`uint` instanceno)

Returns value of an instance of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: DIAMETER.REQ.AVP(266). However, subsequent instances must be retrieved using this method.

VALUE(0) retrieves the first instance, VALUE(1) retrieves the second instance, and so on.

For example, lets assume the Route-Record AVP (code 282) has three instances in a request.

- Route-Record: abcd1.netscaler.com
- Route-Record: abcd2.netscaler.com
- Route-Record: abcd3.netscaler.com

To get the second instance, the expression would be: DIAMETER.REQ.AVP(282).VALUE(1).

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` text_t

`*VENDOR_ID`

Returns the Vendor ID if the AVP has the Vendor-Specific bit set.

`Returns:` unsigned_long_at

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
    "title": "Paradise Lost",
    "price": 16.99
},
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
```

```
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>
```

```
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
```

```
}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

VENDOR_SPEC_RADIUS_AVP_T

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

This topic lists the expressions that are provided by this class.

`*Note` *: Expressions with the * symbol are inherited / promoted from radius_avp_t

- `TYPECAST_RADIUS_AVP_T`

  Convert vendor_spec_radius_avp_t to radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a radius message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(0).
- To get the fourth value of AVP code 26 from a request, use: radius.REQ.AVP(26).VALUE(3).

)

`Returns:` radius_avp_t

`*VENDORID`

Returns the Vendor-Id inside the Vendor_Specific AVP (AVP code 26). `Note:` expression can be used to retrieve the value as Unsigned32

`Returns:` num_at

`*AFTER_REGEX` (`re` regex)

Selects the text after the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length 0 is returned.

Example: HTTP.REQ.HEADER("etag").AFTER_REGEX(re/KX/) will select "DAPPER" from "KXDAPPER". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*AFTER_STR_ANY` (text_t patset_name)

Selects the Text that is present after the first occurrence of any of the strings that are bound to the patset named by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*AFTER_STR` (text_t s)

Selects the Text that is present after the first occurrence of the string argument. If there is no match for the argument in the current Text then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*APPEND` (bool_at b)

Appends the given boolean's string representation to the current string.

`Parameters``:`

b- the boolean value to append.

`Returns:` text_t

`*APPEND` (double_at i)

Appends the given double's string representation to the current string.

`Parameters``:`

i- the double value to append.

`Returns:` text_t

`*APPEND` (ip_address_at addr)

Appends the given IPv4's string representation to the current string.

`Parameters``:`

addr- the IPv4 address to append.

`Returns:` text_t

`*APPEND` (num_at i)

Appends the given number's string representation to the current string.

`Parameters``:`

i- the number value to append.

`Returns:` text_t

`*APPEND` (time_local_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*APPEND` (unsigned_long_at i)

Appends the given unsigned long's string representation to the current string.

`Parameters``:`

i- the unsigned long value to append.

`Returns:` text_t

`*APPEND` (ipv6_address_at addr)

Appends the given IPv6's string representation to the current string.

`Parameters``:`

addr- the IPv6 address to append.

`Returns:` text_t

`*APPEND` (ipv6_subnet_at addr)

Appends the given IPv6 subnet's string representation to the current string.

`Parameters``:`

addr- the IPv6 subnet to append.

`Returns:` text_t

`*APPEND` (mac_address_at addr)

Appends the given MAC's string representation to the current string.

`Parameters``:`

addr- the MAC address to append.

`Returns:` text_t

`*APPEND` (text_t str)

Appends the given string to the current string.

`Parameters``:`

str- the string to append.

`Returns:` text_t

`*APPEND` (time_at t)

Appends the given time's string representation to the current string.

`Parameters``:`

t- the time value to append.

`Returns:` text_t

`*AVPLIST_AFTER`

Returns the region after this AVP in radius message (or in other words returns location at end of this AVP and length covering end of this AVP to end of radius message.

`Returns:` text_t

`*AVPLIST_BEFORE`

Returns the region till this AVP in radius message (or in other words returns location at start of AVPs and length equal to offset of this AVP).

`Returns:` text_t

`*B64DECODE`

Decodes the selected text using base64 decoding.

For example, the string "TWFu" is converted to "Man"

`Returns:` text_t

`*B64ENCODE`

Encodes the selected text using base64 encoding.

For example, the string "Man" is converted to "TWFu"

`Returns:` text_t

`*BEFORE_REGEX` (`re` regex)

Selects the text before the portion that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.RES.HEADER("content-type").BEFORE_REGEX(re#/#) will select "text" from "text/plain". This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*BEFORE_STR_ANY` (text_t patset_name)

Selects the Text that is present before the first occurrence of any of the strings that are bound to the patset or datasetnamed by the string argument. If there is no match to any of the strings bound to the patset in the current Text object then the result Text object has 0 length. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*BEFORE_STR` (text_t s)

Selects the Text that is present before the first occurrence of the string argument. If there is no match for the argument in the current Text object then the result Text object has 0 length. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*BETWEEN` (text_t start, text_t end)

Results in Boolean TRUE value if length of the Text object is greater than or equal to the sum of the Start and End argument lengths and if the prefix of the Text object matches the Start string argument and if the Suffix of the Text object matches the End string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- Start

end- End

`Returns:` bool_at

`*BIN_DECODE` (binary_encoding_e encoding)

Decode the encoded input into its original byte sequence. An incorrectly enooded input will result in an Undef error.

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are encoded.

`Returns:` text_t

`*BIN_ENCODE` (binary_encoding_e encoding)

Encode the input byte sequence. Note that BIN_ENCODE(hex_colons) is equivalent to BLOB_TO_HEX().

`Parameters` (expressions not allowed) `:`

encoding- specifies how the bytes are to be encoded.

`Returns:` text_t

`*BLOB_TO_HEX`

Convert to hexadecimal representation and select text.

For example, the byte string abc is converted to 61:62:63.

`Returns:` text_t

`*COMPARE` (text_t s)

Results in a Number Value which is the result of comparison of the input argument with the Text object. The result is greater than 0 if the Text object is lexicographically greater than the argument. The result is 0 if the Text object and the argument match. The result is less than 0 if the Text object is lexicographically lesser than the argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` num_at

`*CONTAINS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*CONTAINS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text contains any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed)`:`

patset_name- Pattern Set Name

`Returns:` num_at

`*CONTAINS` (text_t s)

Results in Boolean TRUE value if the Text contains the string given in the argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*COUNT`

Returns the number of occurences of an AVP in radius message. The system does not keep track of more than 16 AVP occurences of an AVP. The result will be undefined if there are more than 16 instances of that AVP.

`Returns:` num_at

`*CRC32`

Returns a 32-bit integer computed by applying a CRC (cyclic redundancy check) function to the selected text. This is the CRC function used by Ethernet, MPEG-2, PKZIP, GZIP, PNG, and many other applications. For example, the expression to compute the CRC value of the (first 1000 bytes of the) body of an HTTP request is: HTTP.REQ.BODY(1000).CRC32

`Returns:` num_at

`*DECODE_USING_TEXT_MODE`

Decodes the selected text using the currently configured text encoding methods like URLENCODED, BACKSLASH_ENCODED, PLUS_AS_SPACE, NOURLENCODED, NO_BACKSLASH_ENCODED and NO_PLUS_AS_SPACE. Text encoding methods are set using SET_TEXT_MODE method.

`Returns:` text_t

`*DECRYPT`

Decrypt the selected base64-encoded ciphertext using the configured encryptionParams.

`Returns:` text_t

`*DECRYPT` (binary_encoding_e in_encoding)

Decrypt the selected ciphertext using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*DECRYPT` (text_t encryptionKey, binary_encoding_e in_encoding)

Decrypt the selected base64-encoded encrypted bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format, and optional initialization vector (IV).

in_encoding- specifies how the input ciphertext is encoded. If the ciphertext is not encoded as specified, causes an Undef error.

`Returns:` text_t

`*DIGEST` (digest_method_e method)

Returns a byte sequence computed by applying the the specified message digest method to the selected text.

`Parameters` (expressions not allowed) `:`

method- digest method to apply to the input text

`Returns:` text_t

`*ENCRYPT`

Encrypt the selected plaintext bytes using the configured encryptionParams. The resulting ciphertext is base64-encoded.

`Returns:` text_t

`*ENCRYPT` (binary_encoding_e out_encoding)

Encrypt the selected plaintext bytes using the configured encryptionParams.

`Parameters` (expressions not allowed) `:`

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

`Returns:` text_t

`*ENCRYPT` (text_t encryptionKey, binary_encoding_e out_encoding)

Encrypt the selected cleartext bytes using the configured encryption key.

`Parameters` (expressions not allowed) `:`

encryptionKey- identifies the encryptionKey object to provide the cipher method, mode, padding, key, encrypted format and optional initialization vector (IV).

out_encoding- specifies how the resulting ciphertext is encoded.

`Returns:` text_t

`*ENDSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*ENDSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text ends with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*ENDSWITH` (text_t end)

Results in Boolean TRUE value if a suffix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

end- String

`Returns:` bool_at

`*EQUALS_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*EQUALS_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text equals any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*EQ` (text_t s)

Results in Boolean TRUE value if the Text object matches the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*EXISTS`

Returns true if the AVP exists in the message.

`Returns:` bool_at

`*GET_SIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_SIGNED8` (`uint` n)

Get the 8-bit signed binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_UNSIGNED16` (`uint` n, endian_e endianness)

Get the 16-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` num_at

`*GET_UNSIGNED32` (`uint` n, endian_e endianness)

Get the 32-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED64` (`uint` n, endian_e endianness)

Get the 64-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

endianness- Select little or big endian

`Returns:` unsigned_long_at

`*GET_UNSIGNED8` (`uint` n)

Get the 8-bit unsigned binary integer at the given offset.

`Parameters``:`

n- Offset in bytes

`Returns:` num_at

`*GET_URLSET_METADATA` (text_t urlset_name)

Returns metadata value corresponding to pattern in the urlset. The matching is case-insensitive for domains, but case-sensitive for paths. If no pattern is matched within the urlset, the return value is a NULL string. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).GET_URLSET_METADATA("urlset_forbidden") returns value when the combined domain and URL is looked up in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` text_t

`*GE` (text_t s)

Results in Boolean TRUE value if the Text object is greater than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*GRPC`

Interprets a text_t string as a Protocol Buffer (protocol_buffer_t type). Example: HTTP.REQ.BODY(1000).GRPC.STRING(1).EQ("bookname")

`Returns:` protocol_buffer_t

`*GT` (text_t s)

Results in Boolean TRUE value if the Text object is greater than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*HASH`

Returns a positive 31 bit integer value computed by applying a proprietary NetScaler hash function to the selected text. This function is not case- sensitive and ignores whitespaces. For example, applying the HASH function to two strings "Ab c" and "abc" would produce the same value. This function should not be used for security purposes; use instead the DIGEST function with one of the standard digest methods.

`Returns:` num_at

`*HMAC` (text_t hmacKey)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key.

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

`Returns:` text_t

`*HMAC` (text_t hmacKey, binary_encoding_e out_encoding)

Returns a byte sequence computed by applying the HMAC (Hash Message Authenticastion Code) function to the selected text using the configured HMAC key .

`Parameters` (expressions not allowed)`:`

hmacKey- indentifies the hmacKey object to provide the digest (hash) method and the key.

out_encoding- specifies how the resulting HMAC is encoded.

`Returns:` text_t

`*HTML_XML_SAFE`

Apply XML safe transform and select text.

Converts '<', '>' and '&' in the input text to '<', '>' and '&' respectively; other characters in the input are not modified. This transform safeguards against XSS based attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_HEADER_SAFE`

Apply Header safe transform and select text. Converts all new line ('\\n') characters present in the input text to '%0A' so that they can safely be used in HTTP headers. This transform safeguards against response-splitting attacks. This is a read only operation.

`Returns:` text_t

`*HTTP_URL_SAFE`

Apply URL safe transform and select text. Converts URL unsafe characters to corresponding '%xx' values and retains the rest. This is a read only operation.

```
Based on RFC2396, following are considered URL safe characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Exclamation mark: "!"

    Tilde: "~"

    Asterix: "&ast;"

    Single quote: "'"

    Open and close parentheses: "(", ")"

    Semi-colon: ";"

    Colon: ":"
```

```
    At symbol: "@"

    Question mark: "?"

    Equals: "="

    Dollar: "$"

    Percent: "%"

    Ampersand: "&"

    Plus: "+"

    Comma: ","

    Forward slash: ".html"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL unreserved characters, please consider using URL_RESERVED_CHARS_SAFE method.

`Returns:` text_t

`*INSTANCE` (`uint` instanceno)

Returns instances of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: radius.REQ.AVP(26). However, subsequent instances must be retrieved using this method.

INSTANCE(0) retrieves the first instance, INSTANCE(1) retrieves the second instance, and so on.

For example, to get the second instance, the expression would be: radius.REQ.AVP(282).INSTANCE(1).

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` radius_avp_t

`*IS_BOOL_AT`

Results in Boolean TRUE value if the Text is of boolean type.

`Returns:` bool_at

`*IS_DOUBLE_AT`

Results in Boolean TRUE value if the Text is of double data type.

`Returns:` bool_at

`*IS_IPV6_AT`

Results in Boolean TRUE value if the Text is of IPv6 data type.

`Returns:` bool_at

`*IS_IPV6_SUBNET_AT`

Results in Boolean TRUE value if the Text is of IPv6 subnet data type.

`Returns:` bool_at

`*IS_IP_AT`

Results in Boolean TRUE value if the Text is of IPv4 data type.

`Returns:` bool_at

`*IS_MAC_ADDRESS_AT`

Results in Boolean TRUE value if the Text is of mac address data type.

`Returns:` bool_at

`*IS_NUM_AT`

Results in Boolean TRUE value if the Text is of number type.

`Returns:` bool_at

`*IS_NUM_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of number type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*IS_STRINGMAP_KEY` (text_t string_map_name)

Returns true if the string that it operates on is present in the string map. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). IS_STRINGMAP_KEY("url_stringmap") returns true if value of HTTP.REQ.URL is present as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` bool_at

`*IS_TIME_AT`

Results in Boolean TRUE if the Text follows any of the standard time formats given below, otherwise false. Tue, 05 Nov 1994 08:12:31 GMT RFC822 Tuesday, 05-Nov-94 08:12:31 GMT RFC850 Tue Nov 4 08:12:31 1994 asctime

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT`

Results in Boolean TRUE value if the Text is of unsigned long data type.

`Returns:` bool_at

`*IS_UNSIGNED_LONG_AT` (num_format_e format)

Results in Boolean TRUE value if the Text is of unsigned long data type with given input base.

`Parameters` (expressions not allowed) `:`

format- number format

`Returns:` bool_at

`*JWT_VERIFY_CERTKEY` (text_t certkey_name)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key in the X.509 certificate in the specified certkey object. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*JWT_VERIFY_XML` (text_t xml_pkey)

Verifies the signature on the input JSON Web Token (JWT), using the RSA public key supplied by the specified XML element. The token has the format HEADER.PAYLOAD.SIGNATURE where

- HEADER is a base64-encoded JSON structure indicating a signature algorithm and token type, e.g.'{"alg":"RS256","typ":"JWT"}'
- PAYLOAD is a base64-encoded JSON structure with asserted claims, e.g. '{"loggedInAs":"admin","iat":1422779638}'
- SIGNATURE is the base64-encoded bytes for the signature on HEADER.PAYLOAD.

Returns true if the signature is verified for the header and payload using the specified public key; false if the signature is not verified

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the public key. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, if the token is not correctly formatted, or if the verification operation cannot complete.

`Returns:` bool_at

`*LENGTH`

Returns the AVP length including AVP header.

If the AVP is not present, it returns length 0. If multiple occurences of the AVP exist, it returns the length of first occurence.

`Returns:` num_at

`*LE` (text_t s)

Results in Boolean TRUE value if the Text object is less than or equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*LOCATION_LONG`

Get the location qualifier from CLIENT.IP.SRC.LOCATION.GET(n) (ISO short name) and then convert it to human readable long name. This conversion is valid only for country names. Correct Country qualifier value (number) in GET(n) is left up to the user as qualifiers are user configurable. Expression example: CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG For example: Data from each expression CLIENT.IP.SRC.LOCATION: NA.US.California.SantaClara.*.* CLIENT.IP.SRC.LOCATION.GET(1): US CLIENT.IP.SRC.LOCATION.GET(1).LOCATION_LONG: United States

`Returns:` text_t

`*LT` (text_t s)

Results in Boolean TRUE value if the Text object is less than the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*MAP_STRING_DEFAULT_TO_KEY` (text_t string_map_name)

Returns the value corresponding to the key in the string map. This is similar to the MAP_STRING method, but if the key is not present then instead of returning a null string, it returns the key itself. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MAP_STRING` (text_t string_map_name)

Returns value corresponding to key in the string map. Key is the string that it is given as input. Text mode IGNORECASE, NOIGNORECASE - controls whether key lookup in string map is case sensitive or not. For example:

- HTTP.REQ.URL.MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap".
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE). MAP_STRING("url_stringmap") returns value when the value of HTTP.REQ.URL is used as key in the string map whose name is "url_stringmap". Key lookup in this case is done case-insensitively.

`Parameters` (expressions not allowed) `:`

string_map_name- identifies the string map.

`Returns:` text_t

`*MARK_SAFE`

Mark the PIXL expression safe without applying any safe transform.

`Returns:` text_t

`*MAX` (text_t s)

Compares the string argument with the current string and returns the max string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*MIN` (text_t s)

Compares the string argument with the current string and returns the min string. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*NE` (text_t s)

Results in Boolean TRUE value if the Text object is not equal to the input argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` bool_at

`*NORMALIZE_URL`

Normalize URL. Normalizes a URL by doing "percent" decoding. See the description for URLENCODED in the SET_TEXT_MODE function. This performs the equivalent of SET_TEXT_MODE(URLENCODED).DECODE_USING_TEXT_MODE, except that it does not change the value of the current text mode.

`Returns:` text_t

`*PKEY_ENCRYPT_PEM_NO_PADDING` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and RSA_NO_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_ENCRYPT_PEM` (text_t pem_pkey)

Encrypts the input text using the RSA public key provided by the PEM string and the RSA_PKCS1_PADDING padding method. The input text to be encrypted cannot be longer than the public key length minus 11 bytes for padding. For example, for a 1024-bit (128 byte) key, the input text cannot be longer than 128 - 11 = 117 bytes. An Undef error will occur if the input text is too long. A null input will also cause an Undef error. Returns the (unencoded binary) encrypted text, which is typically base-64 encoded for use in a message.

`Parameters``:`

pem_pkey- a text expression that supplies a RSA public key in the PEM format. If the text value is not a valid PEM RSA PUBLIC KEY encoding, an Undef error will occur. Example (a 1024-bit public key):

```
"-----BEGIN RSA PUBLIC KEY-----" +

"MIGJAoGBAKl5vgQEj73Kxp+9yn1v5gPR1pnc4oLM2a0kaWwBOsB6rzCIy6znwnvw" +

"CY1xRvQhRlJSAyJbloL7wZFIJ2FOR8Cz+8ZQWXU2syG+udi4EnWqLgFYowF9zK+o" +

"79az597eNPAjsHZ/C2oL/+6qY5a/f1z8bQPrHC4GpFfAEJhh/+NnAgMBAAE=" +

"-----END RSA PUBLIC KEY-----"
```

`Returns:` text_t

`*PKEY_SIGN_CERTKEY` (text_t certkey_name)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified SSL certKey object.

`Parameters``:`

certkey_name- identifies the configured certKey object. Results in an Undef error if the certkey object does not exist or does not contain an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_SIGN_XML` (text_t xml_pkey)

Generates a binary digital signature using the SHA-256 message digest function and an RSA private key from the specified XML element.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyValue> element with the private key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/
mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/
AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/
7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent>"zNjysxcIJV/
J9cTpIgPp2/x1IXHT5GTH8OMuNad0qtRSLjU1QYUmmkm9QcJJAN+7h8FEXWGabySUzBrHj/
IEbw==" <DP>QavUDQLLQpnPJXtVAo6CYhxOMCd68mwTxYKKNLjmC0pd54SFHllTLPE1FZU5EjK6q3nCeijonpfH+XX
DP> <DQ>EiXOKouJzzXTQJC3TqomF7Uf81yQNxWumOqnd11kepXgyfMwyqMvLlAGEkNSEF/
Bz18R3Wv+MIZ/IC3nLBt2xQ==</DQ>
<InverseQ>ocuCmz36CP+N2aGqxaU+BKD5+3RLgRq9LFhULEz2jKx0iV9r76jsAxn3sLcTYYO9eqRPy2cz74AU
nw==</InverseQ> <D>fTBD773a3GzcmgVdfZlaBLpN1ux2mf5uUVrTUQf7eVFm9egm4/
tzC5A9zjC+I/oscwTH8epL3UfRLdtp05Q6pWfJBXEnGo0QmOFFBK4pLx/
5JJpPGZ69ovDFEVOUHyiCfKE/g97T4WX3us0nFe1272zwGlHarM1YYwvfeE08UdE=</D> </
RSAKeyValue> Results in an Undef error if the XML element is invalid or does not correctly specify an RSA private key, or if the signing operation cannot complete.

`Returns:` text_t

`*PKEY_VERIFY_CERTKEY` (text_t certkey_name, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the specified RSA public key in the X.509 certificate in the specified certKey object. Returns true if the signature is verified, false otherwise.

`Parameters``:`

certkey_name- identifies the certkey object containing an X.509 certificate holding the RSA public key.

signature- the binary signature. Results in an Undef error if the certkey object does not exist or does not contain an X.509 certificate with an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PKEY_VERIFY_XML` (text_t xml_pkey, text_t signature)

Verifies if the input text matches the specified signature generated using the SHA-256 messge digest function and the RSA private key associated with the RSA public key supplied by the specified XML element. Returns true if the signature is verified, false otherwise.

`Parameters``:`

xml_pkey- an expression that supplies an <RSAKeyVAlue> element with the public key. Example: <RSAKeyValue> <Modulus>qXm+BASPvcrGn73KfW/mA9HWmdzigszZrSRpbAE6wHqvMIjLrOfCe/AJjXFG9CFGUlIDIluWgvvBkUgnYU5HwLP7xlBZdTazIb652LgSdaouAVijAX3Mr6jv1rPn3t408COwdn8Lagv/7qpjlr9/XPxtA+scLgakV8AQmGH/42c=</Modulus> <Exponent>AQAB</Exponent> </RSAKeyValue>

signature- the binary signature. Results in an Undef error if the XML element is invalid or does not correctly specify an RSA public key, or if the verification operation cannot complete.

`Returns:` bool_at

`*PREFIX` (`char` c, `uint` i)

Select a prefix of the Text. The selected prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*PREFIX` (`uint` i)

Select a prefix of the Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Prefix Length

`Returns:` text_t

`*REGEX_MATCH` (`re` regex)

Returns TRUE if and only if the text contains at least one match of the regular expression argument. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex.

The regular expression has to be of the format: `re<delimiter>regular expression<same delimiter>`

The regular expression cannot be bigger than 1499 characters.

The regular expression should be acceptable by the PCRE regular expression library. Look at http://www.pcre.org/pcre.txt for documentation on the regular expression syntax. In particular, look at the pcrepattern man page.

There are some differences in the allowed syntax w.r.t PCRE syntax. Backreferences are not allowed. It is recommended not to use recursive regular expressions. The dot metacharacter matches newlines also. Unicode is not supported. SET_TEXT_MODE(IGNORECASE) overrides the (?i) internal option specified in the regular expression.

The PCRE library configuration can be seen in the system log, after executing 'nsapimgr -B" call ns_pixl_regex_show_config()"' at the shell prompt.

Some examples:

- HTTP.REQ.HOSTNAME.REGEX_MATCH(re/\[\[:alpha:\]\]+(abc){2,3}/)
- HTTP.REQ.URL.SET_TEXT_MODE(URLENCODED).REGEX_MATCH(re#(a*b+c*)#)

- HTTP.REQ.URL.REGEX_MATCH(re/a(?i)b/) matches ab and aB
- HTTP.REQ.URL.SET_TEXT_MODE(IGNORECASE).REGEX_MATCH(re/ab/) matches ab, aB, Ab and AB
- HTTP.REQ.BODY.REGEX_MATCH(re/(?ixm) (\^ab (.*) cd$) /) does a case-insensitive, multiline match where the dot metacharacter matches newline also. The regex itself can contain whitespace which will be ignored during the matching (x - extended regex).

This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` bool_at

`*REGEX_REPLACE` (`re` regex, text_t replacement, replacemode_e mode)

Selects the text that matches the given regular expression argument and replaces it with the the text given in the second argument. The third argument specifies whether the first match is only replaced when multiple matches occur in the text or all matches are replaced. The match may occur anywhere within the text - if you wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string then the same string is returned.

For example: HTTP.RES.BODY(999).REGEX_REPLACE(re!\\bpassword:\\s*\\b!, "password: ***", ALL) will replace all occurrences of "password:" with "password: ***" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

replacement- String to replace the match

mode- Mode of replacement

`Returns:` text_t

`*REGEX_SELECT` (`re` regex)

Selects the text that matches the given regular expression argument. The first match is returned when multiple matches occur in the text. The match may occur anywhere within the text - if you

wish to "anchor" this, use "\^" at the start of the regex and/or "$" at the end of the regex. When the regular expression does not match the given string, a Text object of length of 0 is returned.

For example: HTTP.REQ.HEADER("via").REGEX_SELECT(re!NS-CACHE-\\d\\.\\d:\\s*\\d{1,3}!) will select "NS-CACHE-7.0: 70" This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

regex- Regular Expression

`Returns:` text_t

`*REPEAT` (`uint` i)

Produces a string which contains 'i' sequential copies of the input string.

`Parameters``:`

i- the number of times to repeat the string (0 or more)

`Returns:` text_t

`*SET_CHAR_SET` (charset_e charset)

Set the character set to use for subsequent functions that use text.

`Parameters` (expressions not allowed) `:`

charset- Character Set

`Returns:` vendor_spec_radius_avp_t

`*SET_TEXT_MODE` (textmode_e mode)

The mode setting of a Text object controls the behavior of many Text operations. The Text mode settings may also control the behavior of some operations in objects (like List) that build upon the Text object. IGNORECASE, NOIGNORECASE - controls whether string comparison is case sensitive or not. URLENCODED - If set then all Text operations are carried out after translating all %HH or %uHHHH encodings in the underlying byte stream. 1. %HH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http%3a/.html" will be decoded to "http:/.html" 2. %uWWHH will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and HH denotes the ascii value of character Z in hexadecimal. For example, the encoded text

"http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" NOURLENCODED - Indicates that no percent encodings are present in the Text object. No percent decoding will be performed on the Text object. PLUS_AS_SPACE - If set then all Text operations are carried out after converting occurrences of the plus character to whitespace. For example, the text "hello+world" will be decoded to "hello world" NO_PLUS_AS_SPACE - If set, then the plus character will not be converted to whitespace in the Text object. BACKSLASH_ENCODED - If set, then all Text operations are carried out after performing the following operations: 1. \\XXX will be translated to the character Y where XXX denotes the ascii value of character Y in octal. The valid range of octal values for this type of encoding is \\0 to \\377. For example, the encoded text "http\ \72/.html" and "http\\072/.html" will both be decoded to "http:/.html" 2. \\xHH will be translated to the character Y where HH denotes the ascii value of character Y in hexadecimal. For example, the encoded text "http\\x3a/.html" will be decoded to "http:/.html" 3. \\\\uWWXX will be translated to the character sequence YZ where WW denotes the ascii value of character Y in hexadecimal and XX denotes the ascii value of character Z in hexadecimal. For example, the encoded text "http%u3a2f.html" and "http%u003a/.html" will both be decoded to"http:/.html" 4. Occurences of "\ \b", "\\n", "\\t", "\\f" and "\\r" are translated to the corresponding ascii characters. NO_BACKSLASH_ENCODED - If set, then backslash decoding will not be performed on the Text object. BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF is raised if either the URLENCODED or BACKSLASH_ENCODED mode is set and a bad encoding corresponding to the specified encoding mode is encountered. NO_BAD_ENCODE_RAISE_UNDEF - If set, then UNDEF will not be raised when a bad encoding is encountered in the Text object. The Text operations operate on characters (as opposed to operating on bytes). By default a single byte represents a character using the ASCII encoding. But if URLENCODED mode is set then 3 bytes may represent a character. A PREFIX(3) operation will select the first 3 characters in the Text object. That means it may select up to 9 bytes for URLENCODED Text object. In the case of multibyte decodings as a result of %uXXXX or \\\\uXXXX, Text operations which attempt to treat the multiple decoded bytes as distinct characters are not allowed.

`Parameters` (expressions not allowed) `:`

mode- Text Mode

`Returns:` vendor_spec_radius_avp_t

`*SKIP` (`char` c, `uint` i)

Select the Text after skipping over a prefix of the current Text. The skipped over prefix is the longest prefix that has at most Count (2nd argument) occurrences of character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SKIP` (`uint` i)

Select the Text after skipping over a prefix in the current Text. The length of the prefix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is skipped over.

`Parameters` (expressions not allowed) `:`

i- Prefix Length

`Returns:` text_t

`*STARTSWITH_ANY` (text_t patset_name)

Results in Boolean TRUE value if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` bool_at

`*STARTSWITH_INDEX` (text_t patset_name)

Returns the numerical index of the matching string, if the Text starts with any of the strings that are bound to the patset or dataset named by the string argument. Returns 0 if there is no match. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` num_at

`*STARTSWITH` (text_t start)

Results in Boolean TRUE value if a prefix of the Text object matches the string argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

start- String

`Returns:` bool_at

`*STRIP_CHARS` (text_t s)

From the selected text remove the characters specified in the string.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_CHARS('.=') or STRIP_CHARS('..=') the selected text will become /fooxyzbar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_CHARS` (text_t s)

Selects the Text after stripping off characters in the end of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_END_CHARS('ar') the selected text will become /foo.xyz=b /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_END_WS`

Selects the Text after stripping off white space in the end of the current Text object.

`Returns:` text_t

`*STRIP_START_CHARS` (text_t s)

Selects the Text after stripping off characters in the beginning of the current Text object.

For example: Say the selected text is / "foo.xyz=bar" /. Then on executing STRIP_START_CHARS('of') the selected text will become /.xyz=bar /. Note that repeating character has same effect as it would be if it present only once. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*STRIP_START_WS`

Selects the Text after stripping off white space in the beginning of the current Text object.

`Returns:` text_t

`*SUBSTR_ANY` (text_t patset_name)

Select any one sub-string that matches any string in the given patset or dataset. The patset cannot have strings longer than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

patset_name- Pattern Set Name

`Returns:` text_t

`*SUBSTR` (`uint` start, `uint` len)

Select the Text object of the given length at the given offset. Offset it 0 based. If there aren't enough characters after the offset then all the remaining characters are selected.

`Parameters``:`

start- Offset

len- Length

`Returns:` text_t

`*SUBSTR` (text_t s)

Select the first Text object that matches the input string argument. The input string cannot be bigger than 255 characters. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

s- String

`Returns:` text_t

`*SUFFIX` (`char` c, `uint` i)

Select a suffix of the Text. The selected suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*SUFFIX` (`uint` i)

Select a suffix of the Text. The length of the suffix is equal to the number in the argument. If there aren't enough characters in the Text object then the entire Text is selected.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TO_LOWER`

Converts the selected text to lower case.

For example, the string "ABCd" is converted to "abcd"

`Returns:` text_t

`*TO_UPPER`

Converts the selected text to upper case.

For example, the string "abcD" is converted to "ABCD"

`Returns:` text_t

`*TRUNCATE` (`char` c, `uint` i)

Select the Text after truncating a suffix from the current Text object. The truncated suffix is the longest possible suffix containing at most Count (2nd arg) occurrences of the character in the 1st argument. This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters``:`

c- Character

i- Count

`Returns:` text_t

`*TRUNCATE` (`uint` i)

Select the Text after truncating a suffix of the Text. The length of the suffix truncated is equal to the number in the argument. If there aren't enough characters in the Text then then all the characters are truncated.

`Parameters``:`

i- Suffix Length

`Returns:` text_t

`*TYPECAST_AVP_T`

Convert text_t to avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_t : Operations that can be performed on the returned AVPs.

`Note:` An AVP can have multiple instances in a Diameter message. However, the system can access only the first 16 instances.

`Example:`

- To get the first value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(0).

- To get the fourth value of AVP code 266 from a request, use: DIAMETER.REQ.AVP(266).VALUE(3).
- To check if AVP code 1000 in the response has the vendor-specific bit set, use: DIAMETER.RES.AVP(1000).IS_VENDOR_SPECIFIC.

)

`Returns:` avp_t

`*TYPECAST_AVP_UNUM_T`

Convert text_t to avp_unum_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (avp_unum_t : In Diameter AVP based expressions can be written as DIAMETER.REQ.AVP(<avpcode>). For example Auth-Application-Id AVP (AVP code 258) can be extracted as DIAMETER.REQ.AVP(258) For few of the important AVPs we provide aliases. For example this AVP based expression can also be written as DIAMETER.REQ.AUTH_APPLICATION_ID. This expression returns either a object of class avp_t or returns a numerical value (object of class unsigned_long_at). The numerical value for this object is derived from the value in first instance of the AVP.)

`Returns:` avp_unum_t

`*TYPECAST_BOOL_AT`

Convert text_t to bool_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (bool_at : Boolean Operations)

`Returns:` bool_at

`*TYPECAST_COOKIE_T`

Convert text_t to cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (cookie_t : The HTTP Cookie type provides operations for a cookie as it appears in the Set-Cookie and Set-Cookie2 header. In this type the Name-Value List operations are also available. The first delimiter is = and the element delimiter is ;. Multiple consecutive ; are treated as one. (Same as applying the method IGNORE_EMPTY_ELEMENTS on a Name-Value List.) You can use the Name-value List operations to access cookie attributes. The name comparison for all list operations is case insensitive. In this type Text operations are also available. Each cookie begins with a COOKIE_NAME=COOKIE_VALUE pair followed by zero or more semi-colon separated attribute-value pairs. If an attribute appears more than once in a cookie, the value associated with the first appearance of the attribute is returned.

Format Cookie: Cookie1=Value;Version=decimal;Value;Domain=Value;Path=Value)

`Returns:` cookie_t

`*TYPECAST_DIAMETER_FLAG_T`

Convert text_t to diameter_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (diameter_flag_t : Provides operation to treat the underlying 1 byte as set of bit flags. then set/unset/test/reset_all operations can be done on flag)

`Returns:` diameter_flag_t

`*TYPECAST_DNS_DOMAINNAME_T`

Convert text_t to dns_domainname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_domainname_t : This object provides operations for parsing the DNS domain name as it appears at various places in the DNS data. The format is abc.foo.com.)

`Returns:` dns_domainname_t

`*TYPECAST_DNS_FLAG_T`

Convert text_t to dns_flag_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (dns_flag_t : Provides operations to test/set/unset a flag in dns header.)

`Returns:` dns_flag_t

`*TYPECAST_DOUBLE_AT`

Convert text_t to double_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_at : Double Value)

`Returns:` double_at

`*TYPECAST_DOUBLE_T` (double_format_e format)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, double_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, ip_address_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, num_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_local_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, time_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one

or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_DOUBLE_T` (double_format_e format, unsigned_long_at default_value)

Convert text_t to double_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (double_t : Treat the underlying text as a Double in the given format. The supported formats are DECIMAL, DECIMAL_PREFIX. All the formats strip off the beginning white space. DECIMAL also strips off trailing white space. DECIMAL requires that all the remaining characters must be a proper double value. DECIMAL_PREFIX requires that at least one or more more characters in the prefix must be a proper double value. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Double

`Returns:` double_t

`*TYPECAST_HTTP_CACHE_CONTROL_T`

Convert text_t to http_cache_control_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cache_control_t : This object provides for the ability to work on HTTP Cache-Control headers. The name comparison for all list operations is case insensitive.)

`Returns:` http_cache_control_t

`*TYPECAST_HTTP_CONTENT_LENGTH_T`

Convert text_t to http_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_content_length_t : The HTTP.REQ.CONTENT_LENGTH or HTTP.RES.CONTENT_LENGTH object can be treated as a

HTTP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` http_content_length_t

`*TYPECAST_HTTP_COOKIE_T`

Convert text_t to http_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_cookie_t : This object provides operations for parsing the HTTP cookie header. The name-value pair is derived from the value in the last instance of Cookie header. The format is Cookie : name0=value0; name1=value1; An HTTP Cookie header can have multiple occurrences. COUNT will return a Number containing how many headers of the current type exist. The name comparison for all list operations is case insensitive. The system does not keep track of more than 15 HTTP headers. The result will be undefined if there are more than 15 instances of the header.)

`Returns:` http_cookie_t

`*TYPECAST_HTTP_DATE_T`

Convert text_t to http_date_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_date_t : The HTTP.REQ.DATE or HTTP.RES.DATE object can be treated as a HTTP header or a Time object. The Time value is derived from the value in the last instance of the Date header. The date formats supported are RFC 822 (updated by RFC 1123), RFC 1036 (obsoletes RFC850) and ANSI C asctime() formats.)

`Returns:` http_date_t

`*TYPECAST_HTTP_HEADER_T` (text_t name)

Convert text_t to http_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_header_t : When typecasting a Text object to HTTP Header a header name must be provided.For example: HTTP.REQ.HEADER("MyHdr").TYPECAST_HTTP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` http_header_t

`*TYPECAST_HTTP_HOSTNAME_T`

Convert text_t to http_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_hostname_t : This object provides operations for parsing the HTTP hostname as it appears at various places in the HTTP protocol data. The format is abc.foo.com:8080.)

`Returns:` http_hostname_t

`*TYPECAST_HTTP_METHOD_T`

Convert text_t to http_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_method_t : This object provides Text operations and HTTP Request Method Enum operations on the HTTP request method.)

`Returns:` http_method_t

`*TYPECAST_HTTP_SET_COOKIE_T`

Convert text_t to http_set_cookie_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_set_cookie_t : HTTP.RES.SET_COOKIE provides operations for parsing and operating on the SET-COOKIE header that is present in the HTTP response. HTTP Set-Cookie header supports Text and HTTP Header operations. For most Text operations the value in the last Set-Cookie header is selected. HTTP Set-Cookie header also supports special operations to extract cookies from the response. It is assumed that there will be only one cookie in a Set-Cookie header.)

`Returns:` http_set_cookie_t

`*TYPECAST_HTTP_URL_T`

Convert text_t to http_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_url_t : HTTP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the HTTP request header. The supported format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a HTTP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` http_url_t

`*TYPECAST_HTTP_VERSION_T`

Convert text_t to http_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (http_version_t : HTTP.REQ.VERSION or HTTP.RES.VERSION provide operations to extract HTTP version information.)

`Returns:` http_version_t

`*TYPECAST_IPV6_ADDRESS_AT`

Convert text_t to ipv6_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_at : Provides operations for the 128-bit IPv6 address value. Some general information regarding IPv6 expressions: IPv6 PIXL expressions can be combined with other PIXL expressions using the '+' operator. The output is expected to be the concatenation of the string representations of the individual PIXL expressions. No other operator other than '+' is expected to work when any of the operands is an IPv6 PIXL expression. Also, IPv6 PIXL expressions can be combined with any other type of PIXL expression except a PIXL expression that produces a bool result. In other words, if A and/or B are two IPv6 addresses, A+B should result in the string AB. When one of A or B is an IPv6 address, the other can only be a number or a string and not a boolean. Further, when A and/or B is an IPv6 address, the only operator allowed between them is '+'.

Example: Let the client source IPv6 address be ABCD:1234::ABCD. Let the server destination IPv4 address be 10.100.10.100. Then the expression CLIENT.IPV6.SRC + SERVER.IP.DST should produce the output "ABCD:1234::ABCD10.100.10.100". Similarly, CLIENT.IPV6.SRC + 5 should produce the result ABCD:1234::ABCD5)

`Returns:` ipv6_address_at

`*TYPECAST_IPV6_ADDRESS_T`

Convert text_t to ipv6_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_address_t : This object represents an IPv6 address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF format.)

`Returns:` ipv6_address_t

`*TYPECAST_IPV6_SUBNET_AT`

Convert text_t to ipv6_subnet_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_at : Provides operations for the integral IPv6 subnet address value.)

`Returns:` ipv6_subnet_at

`*TYPECAST_IPV6_SUBNET_T`

Convert text_t to ipv6_subnet_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ipv6_subnet_t : This object represents an IPv6 subnet address present in the 1000:1001:CD10:0000:0000:89AB:4567:CDEF/64 format.)

`Returns:` ipv6_subnet_t

`*TYPECAST_IP_ADDRESS_AT`

Convert text_t to ip_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_at : Provides operations for the 32-bit integral IP address value.)

`Returns:` ip_address_at

`*TYPECAST_IP_ADDRESS_T`

Convert text_t to ip_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_address_t : Represents an IP address present in the 10.100.200.1 format.)

`Returns:` ip_address_t

`*TYPECAST_IP_OPTIONS_T`

Convert text_t to ip_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_t : IP protocol options)

`Returns:` ip_options_t

`*TYPECAST_IP_OPTIONS_TYPE_T`

Convert text_t to ip_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_options_type_t : IP Options Type)

`Returns:` ip_options_type_t

`*TYPECAST_IP_TOS_T`

Convert text_t to ip_tos_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ip_tos_t : Provides operations to TOS field in IP header.)

`Returns:` ip_tos_t

`*TYPECAST_LIST_T` (`char` sep)

Convert text_t to list_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (list_t : The character separator has to be provided when typecasting a textual context to list type. The current text mode has no effect on the character separator. For example if the current text mode is IGNORECASE and the separator is p then P will not be treated as a separator.)

`Parameters` (expressions not allowed) `:`

sep- Separator

`Returns:` list_t

`*TYPECAST_MAC_ADDRESS_AT`

Convert text_t to mac_address_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_at : Provides operations for the 48-bit MAC address value.)

`Returns:` mac_address_at

`*TYPECAST_MAC_ADDRESS_T`

Convert text_t to mac_address_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (mac_address_t : Represents a MAC address present in the 12:34:56:78:9a:bc format.)

`Returns:` mac_address_t

`*TYPECAST_NUM_AT`

Convert text_t to num_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_at : Number Value)

`Returns:` num_at

`*TYPECAST_NUM_T` (num_format_e format)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and

HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` num_t

`*TYPECAST_NUM_T` (num_format_e format, num_at default_value)

Convert text_t to num_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (num_t : Treat the underlying text as a Number in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` num_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters have to be provided when typecasting a Text object to a Name-Value List. The first delimited separates the name from the value. The second delimiter separates list items. For example typecast_nvlist_t('=', '&') handles a URL query string. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

`Returns:` nvlist_t

`*TYPECAST_NVLIST_T` (`char` sep1, `char` sep2, `char` quote)

Convert text_t to nvlist_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (nvlist_t : Two character delimiters and quote-character have to be provided when typecasting a Text object to a Name-Value List that supports quote-character. The first delimited separates the name from the value. The second delimiter separates list items. The third value specifies the quote character. For example typecast_nvlist_t('=', ';', "") handles a name-value list separated by semi-colons that allows quoting. The quote-character specifies that the value can occur within the quotes and the delimiters within the quote-characters should not be taken into account. The Text Mode has no effect on the character delimiters. For example if the current text mode is IGNORECASE and a delimiter is p then P will not be treated as a delimiter.)

`Parameters` (expressions not allowed) `:`

sep1- delimiter1

sep2- delimiter2

quote- quote-character.

`Returns:` nvlist_t

`*TYPECAST_PROTOCOL_BUFFER_T`

Convert text_t to protocol_buffer_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (protocol_buffer_t : gRPC Protocol Buffers interface)

`Returns:` protocol_buffer_t

`*TYPECAST_RADIUS_AVP_VALUE_T`

Convert text_t to radius_avp_value_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (radius_avp_value_t : Provides operations to typecast RADIUS AVP value to Integer value or IP Address.)

`Returns:` radius_avp_value_t

`*TYPECAST_SEQ_TEXT_T`

Convert text_t to seq_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (seq_text_t : Represents the Text Sequence class.)

`Returns:` seq_text_t

`*TYPECAST_SERVICEPATH_T`

Convert text_t to servicepath_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (servicepath_t : Operations that can be performed on the service path.

`Example:`

- To get the name of the service path applicable to current subscriber, use: SUBSCRIBER.SERVICEPATH
- To determine If the service function is the next in the service path applicable to scubscriber, use: SUBSCRIBER.SERVICEPATH.IS_NEXT().

)

`Returns:` servicepath_t

`*TYPECAST_SIP_CALLID_HEADER_T`

Convert text_t to sip_callid_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_callid_header_t : This object provides operations for parsing the SIP callid header.)

`Returns:` sip_callid_header_t

`*TYPECAST_SIP_CONTENT_LENGTH_T`

Convert text_t to sip_content_length_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_content_length_t : The SIP.REQ.CONTENT_LENGTH or SIP.RES.CONTENT_LENGTH object can be treated as a SIP Header or as a Number. The numerical value for this object is derived from the value in the last instance of the Content-Length header.)

`Returns:` sip_content_length_t

`*TYPECAST_SIP_FROM_HEADER_T`

Convert text_t to sip_from_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_from_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_from_header_t

`*TYPECAST_SIP_HEADER_T` (text_t name)

Convert text_t to sip_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_header_t : When typecasting a Text object to SIP Header a header name must be provided.For example: SIP.REQ.HEADER("MyHdr").TYPECAST_SIP_HEADER_T("InHdr"))

`Parameters` (expressions not allowed) `:`

name- Header Name

`Returns:` sip_header_t

`*TYPECAST_SIP_HOSTNAME_T`

Convert text_t to sip_hostname_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_hostname_t : This object provides operations for parsing the SIP hostname as it appears at various places in the SIP protocol data. The format is abc.foo.com:5060.)

`Returns:` sip_hostname_t

`*TYPECAST_SIP_METHOD_T`

Convert text_t to sip_method_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_method_t : This object provides Text operations and SIP Request Method Enum operations on the SIP request method.)

`Returns:` sip_method_t

`*TYPECAST_SIP_TO_HEADER_T`

Convert text_t to sip_to_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_to_header_t : This object provides operations for parsing the SIP From header.)

`Returns:` sip_to_header_t

`*TYPECAST_SIP_URL_T`

Convert text_t to sip_url_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_url_t : SIP.REQ.URL provides operations for parsing and operating on the URL that is present in the first line of the SIP request header. The supported

format is \[<protocol>://<hostname>\]<path>?<query>. The Text object backing a SIP URL object has the Text Mode set to URLENCODED by default.)

`Returns:` sip_url_t

`*TYPECAST_SIP_VERSION_T`

Convert text_t to sip_version_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_version_t : SIP.REQ.VERSION or SIP.RES.VERSION provide operations to extract SIP version information.)

`Returns:` sip_version_t

`*TYPECAST_SIP_VIA_HEADER_T`

Convert text_t to sip_via_header_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sip_via_header_t : This object provides operations for parsing the SIP Via header.)

`Returns:` sip_via_header_t

`*TYPECAST_SSLVPN_MODE_T`

Convert text_t to sslvpn_mode_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (sslvpn_mode_t : This object provides Text operations and SSLVPN Mode Enum operations on the SSLVPN request method.)

`Returns:` sslvpn_mode_t

`*TYPECAST_SSL_TEXT_T` (text_t name)

Convert text_t to ssl_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (ssl_text_t : Treat the underlying text object as SSL Text.)

`Parameters` (expressions not allowed) `:`

name- Name

`Returns:` ssl_text_t

`*TYPECAST_TCP_OPTIONS_T`

Convert text_t to tcp_options_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_t : TCP Protocol Options)

`Returns:` tcp_options_t

`*TYPECAST_TCP_OPTIONS_TYPE_T`

Convert text_t to tcp_options_type_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_options_type_t : TCP Protocol Options Type)

`Returns:` tcp_options_type_t

`*TYPECAST_TCP_REPEATER_OPTION_T`

Convert text_t to tcp_repeater_option_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (tcp_repeater_option_t : TCP Protocol Option : Repeater)

`Returns:` tcp_repeater_option_t

`*TYPECAST_TEXT_T`

Convert radius_avp_t to text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (text_t : Designates any piece of text.)

`Returns:` text_t

`*TYPECAST_TIME_AT`

Convert text_t to time_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s.)

`Returns:` time_at

`*TYPECAST_TIME_LOCAL_AT`

Convert text_t to time_local_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_local_at : Treats a number value as number of seconds since GMT Jan 1 1970 0h 0m 0s as adjsuted for the local time zone.)

`Returns:` time_local_at

`*TYPECAST_TIME_T`

Convert text_t to time_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (time_t : This object treats a Text object as a date string. The formats supported are

1\. RFC822 :: Sun, 06 Nov 1994 08:49:37 GMT 2\. RFC850 :: Sunday, 06-Nov-94 08:49:37 GMT 3\. ASCTIME :: Sun Nov 6 08:49:37 1994 4\. ASCTIME like :: Sun Nov 6 08:49:37 1994 5\. ASCTIME like :: Sun Nov 06 08:49:37 1994 6\. Http Set-Cookie Expiry date :: Sun, 06-Nov-1994 08:49:37 GMT)

`Returns:` time_t

`*TYPECAST_UNSIGNED_LONG_AT`

Convert text_t to unsigned_long_at. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_at : Unsigned Long(64bit) Value)

`Returns:` unsigned_long_at

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error.)

`Parameters` (expressions not allowed) `:`

format- Format

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, ip_address_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining

characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, unsigned_long_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, num_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_local_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNSIGNED_LONG_T` (unsigned_long_format_e format, time_at default_value)

Convert text_t to unsigned_long_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unsigned_long_t : Treat the underlying text as a Unsigned Long in the given format. The supported formats are DECIMAL, HEX, DECIMAL_PREFIX, HEX_PREFIX. All the formats strip off the beginning white space. DECIMAL and HEX also strip off trailing white space. DECIMAL and HEX require that all the remaining characters must be proper digits. DECIMAL_PREFIX and HEX_PREFIX require that at least one or more more characters in the prefix must be proper digits. In case of overflow, there will be a parsing error. In case of parsing error the default value will be assumed.)

`Parameters` (expressions not allowed) `:`

format- Format

default_value- Number

`Returns:` unsigned_long_t

`*TYPECAST_UNUM_TEXT_T`

Convert text_t to unum_text_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (unum_text_t : Provides operations to treat the underlying OctectString as Binary String or unsigned long value .)

`Returns:` unum_text_t

`*TYPECAST_URL_CATEGORY_T`

Convert text_t to url_category_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (url_category_t : Retrieves URL category and attributes from an URL)

`Returns:` url_category_t

`*TYPECAST_VENDOR_SPEC_APPID_AVP_T`

Convert text_t to vendor_spec_appid_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_appid_avp_t : Retrieves AVPs that are nested in the grouped AVP Vendor-Specific-Application-Id (code 260). The nested AVPs are:

- Vendor-Id
- Auth-Application-Id
- Acct-Application-Id

For example, to retrieve the Auth-Application-Id AVP from the Vendor-Specific-Application-Id AVP:

- For requests:
  DIAMETER.REQ.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID
- For responses:
  DIAMETER.RES.VENDOR_SPECIFIC_APPLICATION_ID.AUTH_APPLICATION_ID

)

`Returns:` vendor_spec_appid_avp_t

`*TYPECAST_VENDOR_SPEC_RADIUS_AVP_T`

Convert text_t to vendor_spec_radius_avp_t. Will raise an undef if the value is null, empty, or the value has an invalid format for the destination type. (vendor_spec_radius_avp_t :

- Vendor-Id

To retrieve the Vendor-Id from the Vendor-Specific AVP:

- RADIUS.REQ.VENDOR_SPECIFIC.VENDORID

)

`Returns:` vendor_spec_radius_avp_t

`*UNQUOTE` (`char` c)

If selected text is quoted by character c, Remove character c from beginning and end.

For example: Say the selected text is / "foo xyz bar " /. Then on executing UNQUOTE("") the selected text will become /foo xyz bar / This method is affected by whether the text mode is case sensitive or insensitive.

`Parameters` (expressions not allowed) `:`

c- Character

`Returns:` text_t

`*URLSET_MATCHES_ANY` (text_t urlset_name)

Results in Boolean TRUE value if and only if the Text matches any of the patterns that are specified in the urlset named by the string argument. The matching is case-insensitive for domains, but case-sensitive for paths. For example:

- HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URLSET_MATCHES_ANY("urlset_forbidden") returns true when the combined domain and URL matches any pattern in the urlset whose name is "urlset_forbidden".

`Parameters` (expressions not allowed) `:`

urlset_name- urlset name

`Returns:` bool_at

`*URL_CATEGORIZE` (`uint` min_reputation, `uint` max_reputation)

Returns the URL category for the supplied URL with the given minimum and maximum reputation score. Where a score of 5 is most risky and 1 is least risky. If either score is set to 0, that bound would be ignored. By specifying the reputation scores, the function will returned the category with the highest score (most risky) based on the bounds. If there was an error getting the category or if the URL is invalid then it will result in an Undef error. For example: HTTP.REQ.HOST.APPEND(HTTP.REQ.URL).URL_CATEGORIZE(0, 0) returns value when the combined domain and URL is looked up for the URL category with the highest reputation score (most risky).

`Parameters` (expressions not allowed) `:`

min_reputation- Minimum reputation score of URL category

max_reputation- Maximum reputation score of URL category

`Returns:` url_category_t

`*URL_RESERVED_CHARS_SAFE`

Converts URL reserved characters to corresponding '%XX' values and retains the rest. This is a read only operation.

```
Based on RFC3986, following are considered URL unreserved characters:

    Alpha-numeric characters: a-z, A-Z, 0-9

    Hyphen and underscore: "-", "_"

    Dot: "."

    Tilde: "~"
```

The rest are converted to %XX encoding, 'XX' is the hex-based representation of the input character. If the requirement is to encode all but URL safe characters, please consider using HTTP_URL_SAFE method.

`Returns:` text_t

`*VALUE`

Returns the value of first instance of the AVP as OctetString.. If there are multiple occurence of AVP(28). To get the first instance the expression would be: radius.REQ.AVP(28).VALUE.

`Returns:` radius_avp_value_t

`*VALUE` (`uint` instanceno)

Returns value of an instance of the AVP.

The first instance of the AVP can be retrieved by simply using the expression: radius.REQ.AVP(266). However, subsequent instances must be retrieved using this method.

VALUE(0) retrieves the first instance, VALUE(1) retrieves the second instance, and so on.

`Parameters` (expressions not allowed) `:`

instanceno- AVP instance number. Maximum value: 15.

`Returns:` radius_avp_value_t

`*XML_DECRYPT` (text_t certKeyName)

Decrypt the selected content, which was encrypted using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing the RSA private key to be used to decrypt the bulk encryption key in the selected EncryptedData element.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

`Returns:` text_t

`*XML_ENCRYPT` (text_t certKeyName, encrypt_method_e method, `uint` flags)

Encrypt the selected cleartext using the W3C XML Encryption standard.

`Parameters` (expressions not allowed) `:`

certKeyName- identifies the certkey object containing an X.509 certificate with the RSA public key to be used to encrypt the generated bulk encryption key. Note that the certKey object need not, and usually will not, include the associated RSA private key.

method- specifies the bulk encryption method (rc4, des3, aes128, aes192, or aes256) used to encrypt the content.

flags- optional bit mask to specify optional elements in the EncryptedData element. These are hints to tell the receiver what private key to use to decrypt the bulk encryption key, providing information from the certKey's X.509 certificate.

- 1 - include a KeyName element with the certKeyName;
- 2 - include a KeyValue element with the RSA public key from the certificate;
- 4 - include an X509IssuerSerial element with the certificate serial number and issuer DN;
- 8 - include an X509SubjectName element with the certificate subject DN;
- 16 - include an X509Certificate element with the entire certificate;

`Returns:` text_t

`*XPATH_HTML_WITH_MARKUP` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string, including markup like element tags. node-sets are converted to strings using the standard XPath string conversion routine. The selected portion of the document can be used as the target for rewrite actions.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML_WITH_MARKUP(xp%//md/head/title%) returns the <title> element in the document's <head> This can be used in a rewrite action to replace or delete the <title> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` text_t

`*XPATH_HTML` (`xpath_bool` xpathex)

Applies an XPath expression to the DOM for an HTML document and a boolean value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%boolean(/md/head/meta)%) returns true if the <meta> element exists as a child of <head> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` bool_at

`*XPATH_HTML` (`xpath_double` xpathex)

Applies an XPath expression to the DOM for an HTML document and a double value.

Examples: HTTP.RES.BODY(1000).XPATH_HTML(xp%number(//video/@height)%) returns the numeric value of the height attribute of the first <video> element.

`Parameters` (expressions not allowed) `:`

xpathex- XPath Expression

`Returns:` double_at

`*XPATH_HTML` (`xpath_str` xpathex)

Applies an XPath expression to the DOM for an HTML document and returns the selected node-set or string. node-sets are converted to strings using the standard XPath string conversion routine.

Examples: HTTP.REQ.BODY(1000).XPATH_HTML(xp%//img/@src%) returns the string value of the src attribute of the first

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },
```

```
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "author": "Milton, John",
```

```
    "title": "Paradise Lost",

    "price": 16.99

},
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",

            "price": 16.99

        },

        {

            "author": "Milton, John",

            "title": "Paradise Regained",

            "price": 15.00

        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>
```

```
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
&lt;/Books>
```

```
{
    "Books":
    \[
        {
            "author": "Milton, John",
            "title": "Paradise Lost",
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
```

```
        }

    \]

}
```

```
&lt;Books>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Lost&lt;/title>

        &lt;price>16.99&lt;/price>

    &lt;/Val>

    &lt;Val>

        &lt;author>Milton, John&lt;/author>

        &lt;title>Paradise Regained&lt;/title>

        &lt;price>15.00&lt;/price>

    &lt;/Val>

&lt;/Books>
```

```
{

    "Books":

    \[

        {

            "author": "Milton, John",

            "title": "Paradise Lost",
```

```
            "price": 16.99
        },
        {
            "author": "Milton, John",
            "title": "Paradise Regained",
            "price": 15.00
        }
    \]
}
```

```
&lt;Books>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Lost&lt;/title>
        &lt;price>16.99&lt;/price>
    &lt;/Val>
    &lt;Val>
        &lt;author>Milton, John&lt;/author>
        &lt;title>Paradise Regained&lt;/title>
        &lt;price>15.00&lt;/price>
    &lt;/Val>
```

```
&lt;/Books>
```

VLAN_REQ_T

VLAN Request

This topic lists the expressions that are provided by this class.

- `ID`

  Returns the ID of the VLAN through which the current packet entered the Application Switch as a number.

`Returns:` num_at

VLAN_RES_T

VLAN Response

This topic lists the expressions that are provided by this class.

- `ID`

  Returns the ID of the VLAN through which the current packet entered the Application Switch as a number.

`Returns:` num_at

VSERVER_STATE_E

This object represents state of the Vserver.

Enumerations

UP

State is "UP" for vserver that is UP (running).

DOWN

State is "DOWN" for vserver that is DOWN (not running).

OUT_OF_SERVICE

State is "OUT_OF_SERVICE" for vserver that is out of service. No monitoring packets and no requests are sent to the server that is out of service.

This topic lists the expressions that are provided by this class.

`EQ` (vserver_state_e m)

The result is Boolean TRUE if the input argument is equal to the Vserver State represented by this object.

`Parameters` (expressions not allowed) `:`

m- Vserver State Name

`Returns:` bool_at

`NE` (vserver_state_e m)

The result is Boolean TRUE if the input argument is not equal to the Vserver State represented by this object.

`Parameters` (expressions not allowed) `:`

m- Vserver State Name

`Returns:` bool_at

VSERVER_T

Operates on a vserver

This topic lists the expressions that are provided by this class.

- `ACTIVESERVICES`

  Returns number of active services Raises undef if used on non ADDR based vservers

`Returns:` num_at

- `ACTIVETRANSACTIONS`

  Returns current active transaction counter accumulated on vserver level

`Returns:` unsigned_long_at

- `AVERAGESURGECOUNT`

  Returns average number of requests in surge queue per active service Raises undef if used on non ADDR based vservers

`Returns:` double_at

- `CONNECTIONS`

  Returns number of connections on the vserver as Unsigned long number.

`Returns:` unsigned_long_at

`DETERMINE_SERVICES` (server_attr_e attr, text_t separator)

Determines the services selected by the LoadBalancing Algorithm on a given vserver and returns a list of them in the preference order.

`Parameters` (expressions not allowed) `:`

attr- - Service Attribute which could be service description - 'DESCRIPTION', service name - 'NAME', service IP - 'IP', service port - 'PORT', service IP:port combination - 'IPPORT'

separator- - The string inserted between each of the returned services

`Returns:` text_t

- `HEALTH`

  Returns as number, the percentage of UP services bound to the vserver.

`Returns:` num_at

- `IS_DYNAMIC_LIMIT_REACHED`

  Returns in Boolean TRUE if number of connections on a vserver reached the dynamic threshold, computed as a sum of max clients on all active services under the vserver.

`Returns:` bool_at

- `MAXAUTOSCALEMEMBERS`

  Returns the configured maximum number of autoscale members Raises undef if used on non ADDR based vservers

`Returns:` num_at

- `MINAUTOSCALEMEMBERS`

  Returns the configured minimum number of autoscale members Raises undef if used on non ADDR based vservers

`Returns:` num_at

- `NAME`

  Returns the name of the vserver(CS/LB).

`Returns:` text_t

- `RESPTIME`

  Returns as number, the response time in milli-seconds. RESPTIME is the average TTFB (Time To recieve First Byte) from all the backend services bound to this vserver.

`Returns:` num_at

`SNMP_TABLE` (`uint` index)

Returns the load entry in the SNMP table at given index

`Parameters` (expressions not allowed) `:`

index- Index Raises undef if used on non ADDR based vservers or vserver does not have SNMP load table or the index is out of boundary (valid index values are 0-9)

`Returns:` snmp_table_t

- `STATE`

  Returns the state of vserver.

`Returns:` vserver_state_e

- `SURGECOUNT`

  Returns as number, the number of requests in surge queue of vserver.

`Returns:` unsigned_long_at

- `THROUGHPUT`

  Returns throughput of the vserver in Mbps (Megabits per sec) as Unsigned long number.

`Returns:` unsigned_long_at

VXLAN_REQ_T

VXLAN Request

This topic lists the expressions that are provided by this class.

- `ID`

  Returns the VNID of the VXLAN through which the current packet entered the Application Switch as a number.

`Returns:` num_at

VXLAN_RES_T

VXLAN Response

This topic lists the expressions that are provided by this class.

- `ID`

  Returns the VNID of the VXLAN through which the current packet entered the Application Switch as a number.

`Returns:` num_at

X509_CERTIFICATE_T

X.509 SSL Certificate

This topic lists the expressions that are provided by this class.

- `AUTH_KEYID`

  Returns a string containing the Authority Key Identifier extension of the X509 V3 certificate.

`Returns:` auth_keyid_t

- `CERT_POLICY`

  Returns a string containing the client certificate policy. Note that this represents a sequence of certificate policies.

`Returns:` seq_text_t

- `DAYS_TO_EXPIRE`

  Returns the number of days before which the certificate is valid. Returns -1 for expired certificates.

`Returns:` num_at

- `EXISTS`

  Returns TRUE if the client has an SSL client certificate.

`Returns:` bool_at

- `ISSUER`

  Returns the Distinguished Name of the Issuer as a separated Name-Value list using the delimiter '=' to separate name and value and the delimiter '/' to separate name-value pairs. Example: /C=IN/ST=KA/L=BLR/O=Netscaler Pvt Ltd/OU=www.netscaler.com/CN=www.netscaler.com/emailAddress=ns@ns.co

`Returns:` nvlist_t

- `IS_VALID`

  Returns true if and only if the client certificate is valid.

`Returns:` bool_at

`KEY_USAGE` (key_usage_e k)

Returns a boolean value indicating whether the specified key usage extension bit value in the X509 certificate is set.

`Parameters` (expressions not allowed) `:`

k- The argument specifies which bit is checked. Valid arguments are: DIGITAL_SIGNATURE. Returns TRUE if the digital signature bit is set; FALSE otherwise. NONREPUDIATION. Returns TRUE if the nonrepudiation bit is set; FALSE otherwise. KEYENCIPHERMENT. Returns TRUE if the key encipherment bit is set; FALSE otherwise. DATAENCIPHERMENT. Returns TRUE if the data encipherment bit is set; FALSE otherwise. KEYAGREEMENT. Returns TRUE if the key agreement bit is set; FALSE otherwise. KEYCERTSIGN. Returns TRUE if the key cert sign bit is set; FALSE otherwise. CRLSIGN. Returns TRUE if the CRL bit is set; FALSE otherwise. ENCIPHERONLY. Returns TRUE if the encipher only bit is set; FALSE otherwise. DECIPHERONLY. Returns TRUE if the decipher only bit is set; FALSE otherwise.

`Returns:` bool_at

- `PK_ALGORITHM`

  Returns the name of the public key algorithm used by the SSL key.

`Returns:` text_t

- `PK_SIZE`

  Returns the size of the public key used in the certificate.

`Returns:` num_at

- `SERIALNUMBER`

  Returns the serial number of the client certificate. In the case of non-SSL transaction or error in certificate, returns an empty string.

`Returns:` text_t

- `SIGNATURE_ALGORITHM`

  Returns the name of the cryptographic algorithm used by the CA to sign this certificate.

`Returns:` text_t

- `SUBJECT`

  Returns the Distinguished Name of the Issuer as a separated Name-Value list using the delimiter '=' to separate name and value and the delimiter '/' to separate name-value pairs. Example: /C=IN/ST=KA/L=BLR/O=Netscaler Pvt Ltd/OU=www.netscaler.com/CN=www.netscaler.com/emailAddress=ns@ns.co

`Returns:` nvlist_t

- `SUBJECT_KEYID`

  Returns the Subject KeyID of the client certificate, if one exists. If there is no Subject KeyID, returns a zero-length text object.

`Returns:` text_t

- `TO_PEM`

  Returns the SSL certificate in binary format

`Returns:` text_t

- `VALID_NOT_AFTER`

  Returns the date after which the client certificate is no longer valid.

`Returns:` time_at

- `VALID_NOT_BEFORE`

  Returns the date before which the client certificate is not valid.

`Returns:` time_at

- `VERSION`

  Returns the version number of the certificate. If the connection is not SSL-based, returns zero (0).

`Returns:` num_at