



## Gatekeeper API Functions and Structures

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This chapter describes the API functions and structures that an external application must use to exchange messages with the Cisco IOS Gatekeeper, and contains the following sections:

- [Gatekeeper API Functions, page 5-1](#)
- [API Structures, page 5-12](#)

The external application links with the object code, which contains the API functions. The header file contains API prototypes and type definitions.

### Gatekeeper API Functions

This section describes the functions provided with the API. These functions should be used by the external application to gather information from and provide information to the Cisco IOS Gatekeeper. The functions described in this section are:

- [GkapiSetupClient, page 5-2](#)
- [GkapiSetupServer, page 5-2](#)
- [GkapiClientConnected, page 5-3](#)
- [GkapiAcceptConnection, page 5-4](#)
- [GkapiGetVersion, page 5-4](#)
- [CloseGateKeeperConnection, page 5-5](#)
- [GetReadMsgBuffer, page 5-5](#)
- [ReadMsgBuffer, page 5-5](#)
- [FreeReadMsgBuffer, page 5-7](#)
- [WriteCommandMsg, page 5-7](#)
- [WriteResponseMsg, page 5-8](#)
- [WriteRegisterMessage, page 5-9](#)
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- [GkapiSetupReport, page 5-11](#)
- [GkapiQueryReport, page 5-11](#)

## GkapiSetupClient

This function sets up the socket for the application to communicate as a client with the Cisco IOS Gatekeeper. In this situation, the application is the client and the Gatekeeper is the server, which means the application must initiate the communication with the Cisco IOS Gatekeeper.

### Input

The input to this function is:

- A pointer to the [GKAPI SOCK INFO](#) structure. The application must set up the TCP Port and IP Address fields and must preserve this structure for the duration of the connection.
- A pointer to the [STATUS\\_TYPE](#) enumeration. Possible values for STATUS\_TYPE are:
  - PROCESSING\_SUCCESSFUL—Successful connection to the Cisco IOS Gatekeeper.
  - CONNECT\_IN\_PROGRESS—Connection is pending.
  - TCP\_HANDLE\_ERROR—Error was encountered in handle creation.
  - TCP\_CONNECT\_ERROR—Error was encountered in connecting to the Cisco IOS Gatekeeper.
  - TCP\_NONBLOCK\_ERROR—Error was encountered when setting up the socket for nonblocking I/O
- A boolean value that allows the application to specify if the socket I/O should be nonblocking or blocking. If the application specifies blocking, the Gatekeeper API calls to setup the connection and read a message that does not return until the action is complete.

### Return

The return for this function is an integer. If the client socket connection has been set up successfully or is in progress, a connection handle is returned. This connection handle is the socket descriptor that the application uses to wait on a connection completion or read socket event. If an error occurs while setting up the client connection, the value -1 is returned. In this case, the error information is provided in the STATUS\_TYPE.

## GkapiSetupServer

This function sets up the socket for the application to communicate as a server with the Cisco IOS Gatekeeper. In this situation, the application is the server and the Gatekeeper is the client, which means that the application will accept incoming connections from Cisco IOS Gatekeeper clients.

### Input

- A pointer to the [GKAPI SOCK INFO](#) structure. The application must set up the TCP Port and IP Address fields and must preserve this structure for the duration of the connection.
- A pointer to the [STATUS\\_TYPE](#) enumeration. Possible values for STATUS\_TYPE are:
  - PROCESSING\_SUCCESSFUL—Successful connection to the Cisco IOS Gatekeeper.
  - TCP\_HANDLE\_ERROR—Error was encountered in handle creation.
  - TCP\_ADDRESS\_ALREADY\_IN\_USE—Specified local IP address is already in use.

- TCP\_ADDRESS\_NOT\_AVAIL—Specified local IP address is not available on the local machine.
- TCP\_BIND\_ERROR—Error was encountered in setting up the server socket.
- TCP\_LISTEN\_ERROR—Error was encountered in setting up the server socket.
- TCP\_NONBLOCK\_ERROR—Error was encountered when setting up the socket for nonblocking I/O.
- A boolean value that allows the application to specify if the socket I/O should be nonblocking or blocking. If the application specifies blocking, the Gatekeeper API calls to setup the connection and read a message that does not return until the action is complete.

## Return

The return for this function is an integer. If the client socket connection has been set up successfully or is in progress, a connection handle is returned. This connection handle is the socket descriptor that the application uses to wait on a connection completion or read socket event. If an error occurs while setting up the client connection, the value -1 is returned. In this case, the error information is provided in the STATUS\_TYPE.

## GkapiClientConnected

This function must be called by the application to indicate that a select event for a connect complete has occurred.

## Input

The input to this function is:

- A pointer to the [GKAPI SOCK\\_INFO](#) structure.
- A pointer to the STATUS\_TYPE enumeration. Possible values for STATUS\_TYPE are:
  - PROCESSING\_SUCCESSFUL—Successful connection to the Gatekeeper.
  - TCP\_CONNECT\_ERROR—Error was encountered in connecting to the Gatekeeper.
- An integer that indicates that a connect complete has occurred.

## Return

The return for this function is an integer. If the socket connection has been set up successfully or is in progress, a connection handle is returned. This connection handle is the socket descriptor that the application uses to wait on a connection completion or read socket event. If an error occurs while setting up the client connection, the value -1 is returned. In this case, the error information is provided in the STATUS\_TYPE.

## GkapiAcceptConnection

This function must be called by the application (when it is running in the server mode) to indicate that a select event for an incoming connection has occurred.

### Input

The input to this function is

- A pointer to the [GKAPI SOCK\\_INFO](#) structure.
- A pointer to the STATUS\_TYPE enumeration. Possible values for STATUS\_TYPE are:
  - PROCESSING\_SUCCESSFUL—Successful connection to the Cisco IOS Gatekeeper.
  - TCP\_CONNECT\_ERROR—Error was encountered in connecting to the Cisco IOS Gatekeeper.
- An integer that indicates that an incoming connection has occurred.
- A pointer to the [GKAPI\\_TCP\\_ADDR\\_INFO](#) structure. The Gatekeeper API provides the IP address and TCP port of the client with which this connection is associated.

### Return

The return for this function is an integer. If the socket connection has been set up successfully or is in progress, a connection handle is returned. This connection handle is the socket descriptor that the application uses to wait on a connection completion or read socket event. If an error occurs while setting up the client connection, the value -1 is returned. In this case, the error information is provided in the STATUS\_TYPE.

## GkapiGetVersion

Applications can use this function to obtain the GKTMP version used by the API and the gatekeeper. The version number consists of a major number (gk\_major) and a minor number (gk\_minor). For example, Version 1 is represented as 100.

### Input

The input to this function is

- A pointer to the [GKAPI\\_VERSION\\_INFO](#) structure.

### Return

The return for this function is an integer. The integer indicates one of the following status codes:

- GKAPI\_RET\_OK—Gatekeeper TMP version is prior to or the same as the gatekeeper API version.
- GKAPI\_RET\_NOK—Gatekeeper TMP version is later than the gatekeeper API version.
- GKAPI\_RET\_OK\_NOGKDATA—Version used by the gatekeeper is not known. In this case, the gk\_major and gk\_minor members of GKAPI\_VERSION\_INFO\_T are invalid and set to -1.

## CloseGateKeeperConnection

This function closes the TCP connection between the external application and the Cisco IOS Gatekeeper. This function is called under error circumstances and when the external application no longer wants to maintain a relationship with the Cisco IOS Gatekeeper.

### Input

The input for this function is a pointer to the [GKAPI SOCK\\_INFO](#) structure.

### Return

There is no return for this function.

## GetReadMsgBuffer

This function allocates memory for the size of `GK_READ_MSG` structure. This structure is used to store messages received from the Cisco IOS Gatekeeper. This function contains an enumeration of the messages that can be received (REQUEST messages from the Cisco IOS Gatekeeper for RRQ, ARQ, LRQ, LCF, LRJ, as well as registration and unregistration responses from the Cisco IOS Gatekeeper for ARQ, RRQ, URQ, LRQ, LCF, LRJ messages) and a union of structures for the different messages.

**Note**

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When the external application no longer needs the message buffer, the application must call `FreeReadMsgBuffer` to release the memory back to the system.

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### Input

There is no input to this function.

### Return

The return for this function is a pointer to the [GK\\_READ\\_MSG](#) structure. If the memory allocation fails, this pointer will be NULL.

## ReadMsgBuffer

This function reads a message from the TCP socket and should be called when the external application has detected a read event on the socket. This function stores the message type into the structure. The parameters received in the message are stored in the structure that corresponds with the message type.

**Note**

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`GetReadMsgBuffer` must be called to allocate an empty buffer before this function can be used. `FreeReadMsgBuffer` must be called after this function has completed, except when the `STATUS_TYPE` returns `INCOMPLETE_MSG_READ`.

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After reading a message, this function sets the message type and populates the appropriate structure. For example, if an ARQ message has been received from the Cisco IOS Gatekeeper, the `msgType` parameter is set to `ARQ_REQUEST_MSG` and the `ARQ_REQUEST_MSG` structure is populated.

Because some parameters are optional, these parameters might not be received for a particular message. Structure members that are character pointers are initialized to `NULL`. Integers and enumerations are set to their initialization values. Therefore, the API can assume that if a structure member has a pointer set to `NULL` or to its initialization value, that particular parameter has not been received.

The following initialization values indicate that the parameter was not received from the Cisco IOS Gatekeeper:

- `canMapAlias`—`INITIALIZE_CAN_MAP_ALIAS_VALUE`
- `bandWidthPresent`—`TRUE` (indicating that `bandWidth` has been received and filled in) or `FALSE` (indicating that `bandWidth` has not been received)
- `answerCall`—`INITIALIZE_ANSWER_CALL_VALUE`
- `REDIRECT_REASON_TYPE`—`REDIRECT_REASON_INFO_NOT_RCVD`
- `ENDPOINT_TYPE`—`ENDPOINT_INFO_NOT_RCVD`

## Input

The input for this function is:

- A pointer to the `GKAPI SOCK_INFO` structure.
- A pointer to the `GK_READ_MSG` structure that was allocated by the `GetReadMsgBuffer` function. The `GK_READ_MSG` structure contains an enumeration of the message types expected from the Cisco IOS Gatekeeper and a union of structures for various messages expected from the Cisco IOS Gatekeeper.

## Return

The return for this function is the `STATUS_TYPE`. Possible values for `STATUS_TYPE` are:

- `PROCESSING_SUCCESSFUL`—No errors were encountered.
- `TCP_READ_ERROR`—A TCP read error was encountered. The application should call `CloseGateKeeperConnection` to close the connection to the Cisco IOS Gatekeeper.
- `MEM_ALLOC_FAIL`—Memory allocation failed. This function, dynamically allocates memory for fields within the `GK_READ_MSG` structure.
- `MSG_READ_ERROR`—The message read was not understood by the API function. The application should call `CloseGateKeeperConnection` to close the connection to the Cisco IOS Gatekeeper.
- `INCOMPLETE_MSG_READ`—The message was not completely read from the TCP connection because of network conditions. The application should call the function again in order to continue reading the data. In this situation, `FreeMsgBuffer` should not be called. After all the data has been read, the `STATUS_TYPE` is set to one of the other possible values, and after processing the message type the `FreeMsgBuffer` can be called.
- `TCP_CONNECTION_CLOSED`—The connection to the Cisco IOS Gatekeeper has been closed. The application must call `CloseGateKeeperConnection` to free resources such as `gkHandle` in the `GKAPI SOCK_INFO` structure.
- `NULL_POINTER_PASSED`—The pointer to the `GK_READ_MSG` is null.

## FreeReadMsgBuffer

This function frees memory that was allocated by the call to `GetReadMsgBuffer` and `ReadMsgBuffer`. This function **must** be called after processing the information returned by `ReadMsgBuffer`.

### Input

The input for this function is a pointer to the `GK_READ_MSG` structure.

### Return

There is no return for this function.

## WriteCommandMsg

This function sends a command message to the Cisco IOS Gatekeeper, which can respond with a result message. This structure, `CMD_MSG_TYPE`, contains an enumeration of messages that can be sent as spontaneous commands to the Cisco IOS Gatekeeper. The `CMD_HEADER_INFO_TYPE` structure must include the *from*, *to*, *transaction-id*, and *notification-only* fields.

### Input

The input for this function is:

- A pointer to the `GKAPI SOCK_INFO` structure.
- A pointer to the `GK_CMD_MSG_TYPE` structure, which contains a union of the structures for the various command messages that can be sent to the Cisco IOS Gatekeeper. Each structure contains a header, `CMD_HEADERINFO_TYPE`, that must be filled in by the application. The `msgType` field must be filled in to indicate which command message should be sent to the Cisco IOS Gatekeeper.

### Return

The return for this function is the `STATUS_TYPE`. Possible values for `STATUS_TYPE` are:

- `PROCESSING_SUCCESSFUL`—No errors were encountered.
- `CONNECT_IN_PROGRESS`—Connection is pending. The application should retry this API call after some time has passed.
- `TCP_WRITE_ERROR`—A TCP write error was encountered. The application should call `CloseGateKeeperConnection` to close the connection to the Cisco IOS Gatekeeper.
- `MEM_ALLOC_FAIL`—Memory allocation failed.
- `TCP_CONNECTION_CLOSED`—The connection to the Cisco IOS Gatekeeper has been closed. The application must call `CloseGateKeeperConnection` to free resources such as `gkHandle` in the `GKAPI SOCK_INFO` structure.
- `HEADER_INFO_INCOMPLETE`—One of the fields in the header (*To*, *From*, *TransactionID*) is incomplete.
- `NULL_POINTER_PASSED`—The pointer to the `GK_CMD_MSG` is null.

## WriteResponseMsg

This function writes a response message to the Cisco IOS Gatekeeper. This structure contains [RESPONSE\\_MSG\\_TYPE](#), which is an enumeration of the response messages that can be sent to the Cisco IOS Gatekeeper.

The calling function must set the message type and populate the appropriate structure within the union. For example, if a response RCF needs to be sent to the Cisco IOS Gatekeeper, the application should set the `msgType` to `RCF_RESPONSE_MSG` and populate the `RCF_RESPONSE_MSG` structure.

The following rules apply to responses sent by the external application to the Cisco IOS Gatekeeper:

- Transport-addresses must be preceded with “I:”, followed by the address.
- Alias-addresses must be preceded with either “H:”, “E:”, or “M:” followed by the alias address.
- Values in a “sequence of values” must be separated by a space.
- [HEADER\\_INFO](#) must include the “from”, “to” and “transactionID” fields. The notification field is not used with the `WriteResponseMsg` function.

Only changed or new fields should be populated and sent to the Cisco IOS Gatekeeper. Parameters that are not to be sent to the Cisco IOS Gatekeeper must either be set to their initialization value or to NULL (for pointers). The API assumes that if a structure member is set to its initialization value or has a pointer set to NULL, that parameter should not be sent to the Cisco IOS Gatekeeper.

The following initialization values indicate that the parameter should not be sent to the Cisco IOS Gatekeeper:

- `bandWidthPresent`—TRUE (indicating that the `bandWidth` should be sent) or FALSE (indicating that the `bandWidth` should not be sent)
- `REDIRECT_REASON_TYPE`—`REDIRECT_REASON_INFO_NOT_RCVD`
- `ENDPOINT_TYPE`—`ENDPOINT_INFO_NOT_RCVD`



### Note

If the application requires additional time before responding to a message from the Cisco IOS Gatekeeper, the application can send a “delay” message by setting `msgType` to `RIP_RESPONSE_MSG`. The delay value (1 through 65536) must be specified and the `transactionID` must be the same as the one received from the Cisco IOS Gatekeeper.

## Input

The input for this function is:

- A pointer to the [GKAPI SOCK\\_INFO](#) structure.
- A pointer to the [IRR\\_REQUEST\\_MSG](#) structure, which contains an enumeration of message types for which a response might be sent to the Cisco IOS Gatekeeper. The input also contains a union of structures for each message response.

## Return

The return for this function is the [STATUS\\_TYPE](#). Possible values for `STATUS_TYPE` are:

- `PROCESSING_SUCCESSFUL`—No errors were encountered.
- `CONNECT_IN_PROGRESS`—Connection is pending. The application should retry this API call after some time has passed.

- **TCP\_WRITE\_ERROR**—A TCP write error was encountered. The application should call `CloseGateKeeperConnection` to close the connection to the Cisco IOS Gatekeeper.
- **MEM\_ALLOC\_FAIL**—Memory allocation failed.
- **TCP\_CONNECTION\_CLOSED**—The connection to the Cisco IOS Gatekeeper has been closed. The application must call `CloseGateKeeperConnection` to free resources such as `gkHandle` in the `GKAPI_SOCKET_INFO` structure.
- **INVALID\_MSG\_SPECIFIED**—The message type is not within the `RESPONSE_MSG_TYPE` range.
- **INVALID\_ENDPOINT\_SPECIFIED**—The endpoint does not match one of the possible values for `ENDPOINT_TYPE`.
- **INVALID\_REDIRECT\_REASON\_SPECIFIED**—The redirect reason does not match one of the possible values for `REDIRECT_REASON_TYPE`.
- **INVALID\_REJECT\_REASON\_SPECIFIED**—The rejection reason does not match one of the possible values for `REJECT_REASON_TYPE`.
- **INVALID\_DELAY\_SPECIFIED**—The delay is not within the valid range.
- **HEADER\_INFO\_INCOMPLETE**—One of the fields in the header (To, From, TransactionID) is incomplete.
- **NULL\_POINTER\_PASSED**—The pointer to `GK_WRITE_MSG` is null.

## WriteRegisterMessage

This function sends a registration message to the Cisco IOS Gatekeeper and allows triggers to be dynamically registered with the Cisco IOS Gatekeeper. This structure, [REGISTER\\_MSG\\_TYPE](#), contains an enumeration of messages that can be registered with the Cisco IOS Gatekeeper.

The `REGISTER_REQUEST_HEADER` structure must include the “from,” “to,” “priority,” and “notification-only” fields.

### Input

The input for this function is:

- A pointer to the [GKAPI\\_SOCKET\\_INFO](#) structure.
- A pointer to the [GK\\_REGISTER\\_MSG](#) structure, which contains a union of the structures for the various registration messages that can be sent to the Cisco IOS Gatekeeper. Each structure contains a header, `REGISTER_REQUEST_HEADER`, that must be filled in by the application. The `msgType` field must be filled in to indicate which registration message should be sent to the Cisco IOS Gatekeeper.

### Return

The return for this function is the [STATUS\\_TYPE](#). Possible values for `STATUS_TYPE` are:

- **PROCESSING\_SUCCESSFUL**—No errors were encountered.
- **CONNECT\_IN\_PROGRESS**—Connection is pending. The application should retry this API call after some time has passed.

- **TCP\_WRITE\_ERROR**—A TCP write error was encountered. The application should call `CloseGateKeeperConnection` to close the connection to the Cisco IOS Gatekeeper.
- **MEM\_ALLOC\_FAIL**—Memory allocation failed.
- **TCP\_CONNECTION\_CLOSED**—The connection to the Cisco IOS Gatekeeper has been closed. The application must call `CloseGateKeeperConnection` to free resources such as `gkHandle` in the `GKAPI SOCK_INFO` structure.
- **INVALID\_MSG\_SPECIFIED**—The message type is not within the `RESPONSE_MSG_TYPE` range.
- **INVALID\_ENDPOINT\_SPECIFIED**—The endpoint does not match one of the possible values for `ENDPOINT_TYPE`.
- **INVALID\_REDIRECT\_REASON\_SPECIFIED**—The redirect reason does not match one of the possible values for `REDIRECT_REASON_TYPE`.
- **HEADER\_INFO\_INCOMPLETE**—One of the fields in the header (To, From, TransactionID) is incomplete.
- **NULL\_POINTER\_PASSED**—The pointer to the `GK_REGISTER_MSG` is null.

The following initialization values indicate that the parameter should not be sent to the Cisco IOS Gatekeeper for Registration, and the external application is not interested in these parameters:

- `REDIRECT_REASON_TYPE - REDIRECT_REASON_INFO_NOT_RCVD`
- `ENDPOINT_TYPE - ENDPOINT_INFO_NOT_RCVD`

## WriteUnregisterMessage

This function sends an unregister message to the Cisco IOS Gatekeeper when the application no longer wants to receive a particular message. This structure contains `REGISTER_MSG_TYPE`, which is an enumeration of messages that can be unregistered with the Cisco IOS Gatekeeper.

### Input

The input for this function is:

- A pointer to the `GKAPI SOCK_INFO` structure.
- A pointer to the `GK_UNREGISTER_MSG` structure, which contains the To, From, and Priority fields that must be filled in by the application. The `msgType` must be filled in to indicate which message needs to be unregistered.

### Return

The return for this function is the `STATUS_TYPE`. Possible values for `STATUS_TYPE` are:

- **PROCESSING\_SUCCESSFUL**—No errors were encountered.
- **CONNECT\_IN\_PROGRESS**—Connection is pending. The application should retry this API call after some time has passed.
- **TCP\_WRITE\_ERROR**—A TCP write error was encountered. The application should call `CloseGateKeeperConnection` to close the connection to the Cisco IOS Gatekeeper.
- **MEM\_ALLOC\_FAIL**—Memory allocation failed.

- **TCP\_CONNECTION\_CLOSED**—The connection to the Cisco IOS Gatekeeper has been closed. The application must call `CloseGateKeeperConnection` to free resources such as `gkHandle` in the `GKAPI SOCK_INFO` structure.
- **INVALID\_MSG\_SPECIFIED**—The message type is not within the `RESPONSE_MSG_TYPE` range.
- **HEADER\_INFO\_INCOMPLETE**—One of the fields in the header (To, From, TransactionID) is incomplete.
- **NULL\_POINTER\_PASSED**—The pointer to the `GK_UNREGISTER_MSG` is null.

## GkapiSetupReport

This function allows the application to control the type of debug messages that the Gatekeeper API provides and the location of the debug output.

### Input

The input for this function is:

- An integer that indicates the type of debugging. If the debugging is set to 0, the Gatekeeper API will not output any debug messages.
- A pointer to the [REPORT\\_DEST\\_T](#) enumeration, which indicates the destination for the debug messages.

### Return

There is no return for this function.

## GkapiQueryReport

This function returns the current debug setting for the Gatekeeper API.

### Input

There is no input for this function.

### Return

The return for this function is an integer that indicates the type of debugging being performed by the Gatekeeper API.

# API Structures

The Gatekeeper API stores all data received from the Cisco IOS Gatekeeper in structures. The structures point to character strings, integers, and often enumerations (which are lists of possible values for a specific field). The structures used by the Gatekeeper API are:

- GKAPI SOCK\_INFO
- GKAPI\_TCP\_ADDR\_INFO
- GKAPI\_VERSION\_INFO
- GK\_CMD\_MSG\_TYPE
- CMD\_HEADER\_INFO
- GK\_REGISTER\_MSG
- GK\_UNREGISTER\_MSG
- REG\_UNREG\_RESP\_MSG
- REGISTER\_REQUEST\_HEADER
- REGISTER\_RESPONSE\_HEADER
- ARQ\_REGISTER\_MSG
- RRQ\_REGISTER\_MSG
- URQ\_REGISTER\_MSG
- LRQ\_REGISTER\_MSG
- LCF\_REGISTER\_MSG
- LRJ\_REGISTER\_MSG
- RAI\_REGISTER\_MSG
- DRQ\_REGISTER\_MSG
- BRQ\_REGISTER\_MSG
- GK\_READ\_MSG
- HEADER\_INFO
- ARQ\_REQUEST\_MSG
- RRQ\_REQUEST\_MSG
- URQ\_REQUEST\_MSG
- LRQ\_REQUEST\_MSG
- LCF\_REQUEST\_MSG
- LRJ\_REQUEST\_MSG
- RAI\_REQUEST\_MSG
- DRQ\_REQUEST\_MSG
- BRQ\_REQUEST\_MSG
- IRR\_REQUEST\_MSG
- ALV\_REQUEST\_MSG
- GK\_WRITE\_MSG

- ARQ\_RESPONSE\_MSG
- ACF\_RESPONSE\_MSG
- ARJ\_RESPONSE\_MSG
- RRQ\_RESPONSE\_MSG
- RCF\_RESPONSE\_MSG
- RRJ\_RESPONSE\_MSG
- LRQ\_RESPONSE\_MSG
- LCF\_RESPONSE\_MSG
- LRJ\_RESPONSE\_MSG
- BRQ\_RESPONSE\_MSG
- BCF\_RESPONSE\_MSG
- BRJ\_RESPONSE\_MSG
- ALV\_RESPONSE\_MSG
- CRYPTO\_H323\_TOKEN
- CRYPTO\_EP\_PWD\_HASH
- CRYPTO\_EP\_PWD\_ENCR
- CRYPTO\_EP\_CERT
- CLEAR\_TOKEN
- ALTERNATE\_GK
- ALTERNATE\_ENDPOINT
- ALTERNATE\_TRANSPORT\_ADDR\_TYPE
- RIP\_RESPONSE\_MSG
- UNSUPPORTED\_MSG
- SERV\_CNTRL\_TYPE
- URQ\_CMD\_MSG\_TYPE
- URQ\_RESULT\_MSG
- CALL\_CAPACITY
- CALLS\_AVAILABLE
- CARRIER\_INFO
- PER\_CALLINFO
- REMOTE\_ZONE
- TERMINATION\_CAUSE\_TYPE

## GKAPI SOCK\_INFO

The GKAPI SOCK\_INFO structure is used by several API functions to identify the connection to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-1](#):

**Table 5-1 GKAPI SOCK\_INFO**

Field	Field Type	Description
TCPPort	Integer	The TCP port of the Cisco IOS Gatekeeper that is establishing the incoming connection to the application.
IPAddress	Character string	The IP address of the Cisco IOS Gatekeeper that is establishing the incoming connection to the application.
gkHandle	Integer	Handle to the Cisco IOS Gatekeeper function.
serverHandle	Integer	Handle to the server function.

TCPPort and IPAddress are provided by the calling function. The API writes the handle into gkHandle and serverHandle when the connection is established. If an error is encountered in the handle creation or in the connection, the gkHandle will be set to -1. The external application is responsible for storing the handle and using it to read, write, and close the connection.

## GKAPI TCP\_ADDR\_INFO

The GKAPI TCP\_ADDR\_INFO structure is used to store the TCP Port and IP address. This structure contains the fields shown in [Table 5-2](#):

**Table 5-2 GKAPI TCP\_ADDR\_INFO**

Field	Field Type	Description
TCPPort	Integer	The TCP port that the Cisco IOS Gatekeeper uses for handling GKTMP messages. For GkapiSetupServer, this is the TCP port that the application uses for interacting with the Gatekeeper.
IPAddress	Unsigned long	For GkapiSetupClient, this is the IP address that the Cisco IOS Gatekeeper uses for handling GKTMP messages. For GkapiSetupServer, this is the IP address that the application uses for interacting with the Gatekeeper.

## GKAPI\_VERSION\_INFO

The GKAPI\_VERSION\_INFO structure is used to store the major and minor version numbers of the gatekeeper TMP and API. This structure contains the fields shown in [Table 5-3](#):

**Table 5-3 GKAPI\_VERSION\_INFO**

Field	Field Type	Description
gkapi_major	Integer	The major number identifying the version of the API.
gkapi_minor	Integer	The minor number identifying the version of the API.
gktmp_major	Integer	The major number identifying the version of the TMP.
gktmp_minor	Integer	The minor number identifying the version of the TMP.
GKAPI_MAX_VER_STR_LEN	Character string	The build date and target operating system of the protocol.
gkapi_release_num	Integer	The release number of the gatekeeper API.

## GK\_CMD\_MSG\_TYPE

The GK\_CMD\_MSG\_TYPE structure is used to process commands from the external application to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-4](#):

**Table 5-4 GK\_CMD\_MSG\_TYPE**

Field	Field Type	Description
msgType	Enumeration	See <a href="#">CMD_MSG_TYPE</a> .
urqCmdMsg	Structure	See <a href="#">URQ_CMD_MSG_TYPE</a> .

## CMD\_HEADER\_INFO

The CMD\_HEADER\_INFO structure is used to process header information sent by the application to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-5](#):

**Table 5-5 CMD\_HEADER\_INFO**

Field	Field Type	Description
versionId	Integer	Identifier of the version of GKTMP being used. For the initial release, the only possible value is 1.
from	Character string	Originator of the message. For commands from the external application, this field contains the server ID. The limit of this field is MAX_ENDPOINT_LENGTH + 1.
to	Character string	Receiver of the message. For commands from the external application, this field contains the ID of the gatekeeper that initiated the request. The limit of this field is MAX_ENDPOINT_LENGTH+1.

**Table 5-5** *CMD\_HEADER\_INFO (continued)*

Field	Field Type	Description
transactionID	Character string	Identifier of the transaction. If this field is present in the command to the Cisco IOS Gatekeeper, it must be echoed in the result to the external application. The limit of this field is MAX_TRANSACTION_ID_LENGTH + 1.
notification	Boolean	Whether the message is for notification purposes only.

## GK\_REGISTER\_MSG

The GK\_REGISTER\_MSG structure is used to send registration messages to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-6](#):

**Table 5-6** *GK\_REGISTER\_MSG*

Field	Field Type	Description
msgType	Enumeration	See <a href="#">REGISTER_MSG_TYPE</a> .
rrqRegMsg	Structure	See <a href="#">RRQ_REGISTER_MSG</a> .
urqRegMsg	Structure	See <a href="#">URQ_REGISTER_MSG</a> .
arqRegMsg	Structure	See <a href="#">ARQ_REGISTER_MSG</a> .
lrqRegMsg	Structure	See <a href="#">LRQ_REGISTER_MSG</a> .
lcfRegMsg	Structure	See <a href="#">LCF_REGISTER_MSG</a> .
lrjRegMsg	Structure	See <a href="#">LRJ_REGISTER_MSG</a> .

## GK\_UNREGISTER\_MSG

The GK\_UNREGISTER\_MSG structure is used to send unregistration messages to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-7](#):

**Table 5-7** *GK\_UNREGISTER\_MSG*

Field	Field Type	Description
unregisterMsg	Enumeration	See <a href="#">REGISTER_MSG_TYPE</a> .
versionId	Integer	Identifier of the version of GKTMP being used. For the initial release, the only possible value is 1.
from	Character string	Originator of the message. For requests from the Cisco IOS Gatekeeper, this field contains the gatekeeper ID. For responses from the external application, this field contains the server ID. The limit of this field is MAX_ENDPOINT_LENGTH + 1.

**Table 5-7** GK\_UNREGISTER\_MSG (continued)

Field	Field Type	Description
to	Character string	Receiver of the message. For requests from the Cisco IOS Gatekeeper, this field contains the server ID. For responses from the external application, this field contains the ID of the gatekeeper that initiated the request. The limit of this field is MAX_ENDPOINT_LENGTH + 1.
priority	Integer	Priority of the filter. Possible values are 1 through 20. 1 is the highest priority.

## REG\_UNREG\_RESP\_MSG

The REG\_UNREG\_RESP\_MSG structure is used to process registration and unregistration responses from the Cisco IOS Gatekeeper. This structure contains the field shown in [Table 5-8](#):

**Table 5-8** REG\_UNREG\_RESP\_MSG

Field	Field Type	Description
regHeader	Structure	See REGISTER_RESPONSE_HEADER.

## REGISTER\_REQUEST\_HEADER

The REGISTER\_REQUEST\_HEADER structure is used when a registration request is to be sent to Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-9](#):

**Table 5-9** REGISTER\_REQUEST\_HEADER

Field	Field Type	Description
versionId	Integer	Identifier of the version of GKTMP being used. For the initial release, the only possible value is 1.
from	Character string	Originator of the message, which for registration requests is the server ID. The limit of this field is MAX_ENDPOINT_LENGTH+1.
to	Character string	Receiver of the message, which for registration requests is the gatekeeper ID. The limit of this field is MAX_ENDPOINT_LENGTH+1.
priority	Integer	Priority of the filter. Possible values are 1 through 20. 1 is the highest priority.
notificationOnly	Boolean	Whether the registration request is for notifications only. If this field is set to True, messages that match the specified trigger parameters are sent on a notification-only basis.

## REGISTER\_RESPONSE\_HEADER

The REGISTER\_RESPONSE\_HEADER structure is used when a registration or unregistration response is received from the Cisco IOS Gatekeeper. The registration or unregistration response is received after the application sends a registration or unregistration request to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-10](#):

**Table 5-10 REGISTER\_RESPONSE\_HEADER**

Field	Field Type	Description
version-id	Integer	Identifier of the version of GKTMP being used. For the initial release, the only possible value is 1.
from	Character string	Originator of the message, which for registration responses is the gatekeeper ID. The limit of this field is MAX_ENDPOINT_LENGTH+1.
to	Character string	Receiver of the message, which for registration responses is the server ID. The limit of this field is MAX_ENDPOINT_LENGTH+1.
priority	Integer	Priority of the filter. Possible values are 1 through 20. 1 is the highest priority.
regStatus	Enumeration	See <a href="#">REG_STATUS_TYPE</a> .

## ARQ\_REGISTER\_MSG

The ARQ\_REGISTER\_MSG structure is used to send registrations for ARQ requests to the Cisco IOS Gatekeeper.

This structure contains the fields shown in [Table 5-11](#):

**Table 5-11 ARQ\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint. The limit of this field is MAX_NUM_ARQ_DEST_INFO.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> . The limit of this field is MAX_NUM_ARQ_REDIRECT_REASON.

## RRQ\_REGISTER\_MSG

The RRQ\_REGISTER\_MSG structure is used to send registrations for RRQ requests to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-12](#):

**Table 5-12 RRQ\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
terminalType	Enumeration	Type of endpoint being registered. See <a href="#">ENDPOINT_TYPE</a> . The limit of this field is MAX_NUM_ENDPOINT_TYPES.
supportedPrefix	Character string	Prefix associated with the supported protocol. The limit of this field is MAX_NUM_SUPPORTED_PREFIX.

## URQ\_REGISTER\_MSG

The URQ\_REGISTER\_MSG structure is used to send registrations for URQ requests to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-13](#):

**Table 5-13 URQ\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
terminalType	Enumeration	Type of endpoint being unregistered. See <a href="#">ENDPOINT_TYPE</a> . The limit of this field is MAX_NUM_ENDPOINT_TYPES.
supportedPrefix	Character string	Prefix associated with the supported protocol. The limit of this field is MAX_NUM_SUPPORTED_PREFIX.

## LRQ\_REGISTER\_MSG

The LRQ\_REGISTER\_MSG structure is used to send registrations for LRQ requests to the Cisco IOS Gatekeeper.

This structure contains the fields shown in [Table 5-14](#):

**Table 5-14 LRQ\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint. The limit of this field is MAX_NUM_LRQ_DEST_INFO.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> . The limit of this field is MAX_NUM_LRQ_REDIRECT_REASON.

## LCF\_REGISTER\_MSG

The LCF\_REGISTER\_MSG structure is used to send registrations for LCF requests to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-15](#):

**Table 5-15 LCF\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint. The limit of this field is MAX_NUM_LCF_DEST_INFO.
rmotExtensionAddr	Character String	Alias address of a called endpoint, present in cases where this information is required to traverse multiple gateways. The limit of this field is MAX_NUM_LCF_RMOT_EXTENSION_ADDR.

## LRJ\_REGISTER\_MSG

The LRJ\_REGISTER\_MSG structure is used to send registrations for LRJ requests to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-16](#):

**Table 5-16 LRJ\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint. The limit of this field is MAX_NUM_LRJ_DEST_INFO.

## RAI\_REGISTER\_MSG

The RAI\_REGISTER\_MSG structure is used to send registrations for RAI requests to the Cisco IOS Gatekeeper.

This structure contains the fields shown in [Table 5-17](#):

**Table 5-17 RAI\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
terminalType	Enumeration	Type of endpoint. See <a href="#">ENDPOINT_TYPE</a> . The limit of this field is MAX_NUM_ENDPOINT_TYPES.
supportedPrefix	Character string	Prefix associated with the supported protocol. The limit of this field is MAX_NUM_SUPPORTED_PREFIX.

## DRQ\_REGISTER\_MSG

The DRQ\_REGISTER\_MSG structure is used to send registrations for DRQ requests to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-18](#):

**Table 5-18 RAI\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint. The limit of this field is MAX_NUM_ARQ_DEST_INFO.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> . The limit of this field is MAX_NUM_LRQ_REDIRECT_REASON.

## BRQ\_REGISTER\_MSG

The BRQ\_REGISTER\_MSG structure is used to send registrations for BRQ requests to the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-19](#):

**Table 5-19 BRQ\_REGISTER\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint. The limit of this field is MAX_NUM_ARQ_DEST_INFO.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> . The limit of this field is MAX_NUM_ARQ_REDIRECT_REASON.

## GK\_READ\_MSG

The GK\_READ\_MSG structure is used process REQUEST messages from the Cisco IOS Gatekeeper for the supported RAS messages, as well as registration and unregistration responses from the Cisco IOS Gatekeeper for the supported RAS messages. This structure contains the fields shown in [Table 5-20](#):

**Table 5-20 GK\_READ\_MSG**

Field	Field Type	Description
msgType	Enumeration	See <a href="#">REQUEST_MSG_TYPE</a> .
rrqReqMsg	Structure	See <a href="#">RRQ_REQUEST_MSG</a> .
urqReqMsg	Structure	See <a href="#">URQ_REQUEST_MSG</a> .
arqReqMsg	Structure	See <a href="#">ARQ_REQUEST_MSG</a> .

**Table 5-20 GK\_READ\_MSG (continued)**

Field	Field Type	Description
lrqReqMsg	Structure	See <a href="#">LRQ_REQUEST_MSG</a> .
lcfReqMsg	Structure	See <a href="#">LCF_REQUEST_MSG</a> .
lrjReqMsg	Structure	See <a href="#">LRJ_REQUEST_MSG</a> .
raireqMsg	Structure	See <a href="#">RAI_REQUEST_MSG</a> .
drqreqMsg	Structure	See <a href="#">DRQ_REQUEST_MSG</a> .
brqreqMsg	Structure	See <a href="#">BRQ_REQUEST_MSG</a> .
unsupportedMsg	Structure	See <a href="#">UNSUPPORTED_MSG</a> .
regUnregRespMsg	Structure	See <a href="#">REG_UNREG_RESP_MSG</a> .

If the message received from the Cisco IOS Gatekeeper is a RAS message that is not supported by the API function, the msgType is set to MSG\_NOT\_SUPPORTED. If a response is required, an appropriate response is constructed by the API function and sent to the Cisco IOS Gatekeeper. The header information in the [UNSUPPORTED\\_MSG](#) structure is filled in by the API function. This situation could occur if the Cisco IOS Gatekeeper has been upgraded to support new messages but the API function has not been correspondingly upgraded.

If the message received from the Cisco IOS Gatekeeper, is not recognized by the API function, the msgType is set to UNKNOWN\_MSG and the STATUS\_TYPE is set to MSG\_READ\_ERROR. In this case, the external application should close the connection to the Cisco IOS Gatekeeper by calling the CloseGateKeeperConnection function.

## HEADER\_INFO

The HEADER\_INFO structure is used to process header information sent from the Cisco IOS Gatekeeper or information that is sent by the application to the Cisco IOS Gatekeeper.

This structure contains the fields shown in [Table 5-21](#):

**Table 5-21 HEADER\_INFO**

Field	Field Type	Description
versionId	Integer	Identifier of the version of GKTMP being used. For the initial release, the only possible value is 1.
from	Character string	Originator of the message. For requests from the Cisco IOS Gatekeeper, this field contains the gatekeeper ID. For responses from the external application, this field contains the server ID. The limit of this field is MAX_ENDPOINT_LENGTH + 1.
to	Character string	Receiver of the message. For requests from the Cisco IOS Gatekeeper, this field contains the server ID. For responses from the external application, this field contains the ID of the gatekeeper that initiated the request. The limit of this field is MAX_ENDPOINT_LENGTH+1.

Table 5-21 HEADER\_INFO (continued)

Field	Field Type	Description
transactionID	Character string	Identifier of the transaction. If this field is present in the request from the Cisco IOS Gatekeeper, it must be echoed in the response from the external application. The limit of this field is MAX_TRANSACTION_ID_LENGTH + 1.
notification	Boolean	Whether the message is for notification purposes only. This field is used only in REQUEST messages that are received from the Cisco IOS Gatekeeper.

## ARQ\_REQUEST\_MSG

The ARQ\_REQUEST\_MSG structure is used to process ARQ requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in Table 5-22:

Table 5-22 ARQ\_REQUEST\_MSG

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
srcInfo	Character string	Sequence of alias addresses for the source endpoint.
srcCallSignalAddress	Character string	Transport address used at the source for call signaling.
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint.
destCallSignalAddress	Character string	Transport address used at the destination for call signaling.
destExtraCallInfo	Character string	External addresses for multiple calls.
bandWidthPresent	Boolean	Whether a specified bandwidth is present in the request.
bandWidth	Unsigned integer	Bandwidth (in 100 kbps) requested for the bi-directional call.
answerCall	Integer	Indicates to the Cisco IOS Gatekeeper that the call is incoming.
callIdentifier	Character string	A unique call identifier (set by the originating endpoint), which can be used to associate RAS signaling with the modified Q.931 signaling used in H.225.0.
conferenceID	Character string	A unique conference identifier.
canMapAlias	Integer	Whether the endpoint can copy information from the resulting ACF into the destinationAddress, destExtraCallInfo, and remoteExtensionAddress fields of the SETUP message.
redirectNumber	Character string	Taken from the Number Digits field of Q.931 Setup Redirecting Number IE.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> .
callingOctet3a	Character String	Whether the calling number information can be displayed.

**Table 5-22 ARQ\_REQUEST\_MSG (continued)**

Field	Field Type	Description
displayIE	Character String	Taken from the Q.931 Setup, display IE.
endPointCallSignalAddress	Character String	Call signaling transport address of the endpoint sending the ARQ.
cryptoToken	Pointer	See <a href="#">ALV_RESPONSE_MSG</a> .
clearToken	Pointer	See <a href="#">CLEAR_TOKEN</a> .
srcCarrierID	Character String	Carrier identifier of an inbound call
dstCarrierID	Character String	Target carrier identifier of an outbound call
srcTrunkGroup	Character String	Trunk group of an inbound call
dstTrunkGroup	Character String	Target trunk group of an outbound call
call_capacity	Pointer	The call capacity information of the gateway
gtd	Character String	Generic Transparency Descriptor. Defines parameters and messages of existing SS7 ISUP protocols
terminationCause	Character String	Notifies the GKTMP server of the release complete Cause IE that was sent to the gatekeeper. See <a href="#">TERMINATION_CAUSE_TYPE</a> .
r_count	Unsigned Integer	Used to send additional ARQ messages to the gatekeeper and then to a route server after all alternative endpoints returned in the first ARQ message have failed. Subsequent ARQ messages use the same global call ID and also have a reroute count of one for the first reroute request, which is incremented for each subsequent reroute request.
serviceCntrl	Character String	Service control. See <a href="#">SERV_CNTRL_TYPE</a> .

## RRQ\_REQUEST\_MSG

The RRQ\_REQUEST\_MSG structure is used to process RRQ requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-23](#):

**Table 5-23 RRQ\_REQUEST\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
callSignalAddress	Character string	Call signaling transport address for this endpoint.
rasAddress	Character string	Registration and status transport address for this endpoint.
terminalAlias	Character string	List of alias addresses by which other terminals can identify this terminal.
terminalType	Enumeration	Type of endpoint being registered. See <a href="#">ENDPOINT_TYPE</a> .
supportedPrefix	Character string	Prefix associated with the supported protocol.

**Table 5-23** *RRQ\_REQUEST\_MSG (continued)*

Field	Field Type	Description
cryptoToken	Pointer	See <a href="#">ALV_RESPONSE_MSG</a> .
clearToken	Pointer	See <a href="#">CLEAR_TOKEN</a> .
altTranspAddr	Pointer	See <a href="#">ALTERNATE_TRANSPORT_ADDR_TYPE</a> .
capacityReportingCapability	Boolean	If True, indicates the gateway can report call capacity
call_capacity	Pointer	The call capacity information of the gateway

## URQ\_REQUEST\_MSG

The URQ\_REQUEST\_MSG structure is used to process URQ requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-24](#):

**Table 5-24** *URQ\_REQUEST\_MSG*

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
callSignalAddress	Character string	Call signaling transport address for this endpoint.

## LRQ\_REQUEST\_MSG

The LRQ\_REQUEST\_MSG structure is used to process LRQ requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-25](#):

**Table 5-25** *LRQ\_REQUEST\_MSG*

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
srcInfo	Character string	Sequence of alias addresses for the source endpoint.
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint.
redirectNumber	Character string	Taken from the Number Digits field of Q.931 Setup Redirecting Number IE.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> .
callingOctet3a	Character String	Whether the calling number information can be displayed.
displayIE	Character String	Taken from the Q.931 Setup, display IE.
callingPartyNum	Character String	Taken from the Q.931.
srcCarrierID	Character String	Carrier identifier of an inbound call
dstCarrierID	Character String	Target carrier identifier of an outbound call
bandWidthPresent	Boolean	Indicates if bandwidth has been received

**Table 5-25 LRO\_REQUEST\_MSG (continued)**

Field	Field Type	Description
bandWidth	Unsigned Integer	Bandwidth (in 100 kpbs) requested for a bidirectional call
callIdentifier	Character String	Indicates the type of call, such as a voice call
srcTrunkGroup	Character String	Source trunk group identifier of an inbound call
dstTrunkGroup	Character String	Destination trunk group identifier of an outbound call
gtd	Character String	Generic Transparency Descriptor. Defines parameters and messages of existing SS7 ISUP protocols
terminationCause	Character String	Informs the GKTMP server of the release complete Cause IE that was sent to the gatekeeper. See <a href="#">TERMINATION_CAUSE_TYPE</a> .
r_count	Unsigned Integer	Used to send additional ARQ messages to the gatekeeper and then to a route server after all alternative endpoints returned in the first ARQ message have failed. Subsequent ARQ messages use the same global call ID and also have a reroute count of one for the first reroute request, which is incremented for each subsequent reroute request.

## LCF\_REQUEST\_MSG

The LCF\_REQUEST\_MSG structure is used to process LCF requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-26](#):

**Table 5-26 LCF\_REQUEST\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
srcInfo	Character string	Sequence of alias addresses for the source endpoint.
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint.
callSignalAddress	Character string	Call signaling transport address for this endpoint.
destExtraCallInfo	Character string	External addresses for multiple calls.
redirectNumber	Character string	Taken from the Number Digits field of Q.931 Setup Redirecting Number IE.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> .
callingOctet3a	Character String	Whether the calling number information can be displayed.
callingPartyNum	Character String	Taken from the Q.931.
displayIE	Character String	Taken from the Q.931 Setup, display IE.
rasAddress	Character String	Registration and status transport address for this endpoint.

**Table 5-26 LCF\_REQUEST\_MSG (continued)**

Field	Field Type	Description
rmotExtensionAddr	Character String	Alias address of a called endpoint, present in cases where this information is required to traverse multiple gateways.
destinationType	Enumeration	Type of destination endpoint. See <a href="#">ENDPOINT_TYPE</a> .
altTranspAddr	Pointer	See <a href="#">ALTERNATE_TRANSPORT_ADDR_TYPE</a> .
gtd	Character String	Generic Transparency Descriptor. Defines parameters and messages of existing SS7 ISUP protocols
serviceCntrl	Parameter	LRQ:serviceControl. See <a href="#">SERV_CNTRL_TYPE</a> .
callIdentifier	Character String	ARQ:callIdentifier

## LRJ\_REQUEST\_MSG

The LRJ\_REQUEST\_MSG structure is used to process LRJ requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-27](#):

**Table 5-27 LRJ\_REQUEST\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
srcInfo	Character string	Sequence of alias addresses for the source endpoint.
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint.
redirectNumber	Character string	Taken from the Number Digits field of Q.931 Setup Redirecting Number IE.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> .
callingOctet3a	Character String	Whether the calling number information can be displayed.
displayIE	Character String	Taken from the Q.931 Setup, display IE.
callingPartyNum	Character String	Taken from the Q.931.
rejectReason	Enumeration	Reason for the rejection of the request. See <a href="#">LRJ_REJECT_REASON_TYPE</a> .
serviceCntrl	Parameter	LRQ:serviceControl. See <a href="#">SERV_CNTRL_TYPE</a> .
callIdentifier	Character String	LRQ:callIdentifier

## RAI\_REQUEST\_MSG

The RAI\_REQUEST\_MSG structure is used to process RAI requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-28](#):

**Table 5-28 RAI\_REQUEST\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
callSignalAddress	Character string	Call signaling transport address for this endpoint.
almostOut	Integer	Resource usage indication. The value is TRUE or FALSE.
call_capacity	Pointer	The call capacity information of the gateway

## DRQ\_REQUEST\_MSG

The DRQ\_REQUEST\_MSG structure is used to process DRQ requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-29](#):

**Table 5-29 DRQ\_REQUEST\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">REGISTER_REQUEST_HEADER</a> .
drqReason	Enumeration	Reason received for a DRQ sent by an endpoint. See <a href="#">DRQ_REASON_TYPE</a> .
srcCallSignalAddress	Character string	Transport address used at the source for call signaling.
answeredCall	Integer	Indicates that this party was the original destination. The value is TRUE or FALSE.
callIdentifier	Character string	A unique call identifier (set by the originating endpoint) which can be used to associate RAS signaling with the modified Q.931 signaling used in H225.0.
conferenceID	Character string	A unique identifier.
clearToken	Pointer	See <a href="#">CLEAR_TOKEN</a> .
call_capacity	Pointer	The call capacity information of the gateway
gtd	Character String	Generic Transparency Descriptor. Defines parameters and messages of existing SS7 ISUP protocols
terminationCause	Character String	Informs the GKTMP server of the release complete Cause IE that was sent to the gatekeeper. See <a href="#">TERMINATION_CAUSE_TYPE</a> .

## BRQ\_REQUEST\_MSG

The BRQ\_REQUEST\_MSG structure is used to process BRQ requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-30](#):

**Table 5-30 BRQ\_REQUEST\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
answerCall	Integer	Indicates to the Cisco IOS Gatekeeper that the call is incoming.
bandWidth	Unsigned integer	Bandwidth (in 100 kbps) requested for the bi-directional call.
callIdentifier	Character string	A unique call identifier (set by the originating endpoint), which can be used to associate RAS signaling with the modified Q.931 signaling used in H.225.0.
conferenceID	Character string	A unique conference identifier.
endPointCallSignal Address	Character string	Call signalling transport address for this endpoint.
cryptoToken	Pointer	See <a href="#">ALV_RESPONSE_MSG</a> .
clearToken	Pointer	See <a href="#">CLEAR_TOKEN</a> .

## IRR\_REQUEST\_MSG

The IRR\_REQUEST\_MSG structure is used to process IRR requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-31](#).

**Table 5-31 IRR\_REQUEST\_MSG**

Field	Field Type	Description
srcCallSignalAddress	Character String	Transport address used at the source for call signaling.
perCallInfo	Character String	Contains information about the call, including the call identifier, conference ID, originator, bandwidth, and call start time.

## ALV\_REQUEST\_MSG

The ALV\_REQUEST\_MSG structure is used to process ALV requests from the Cisco IOS Gatekeeper. This structure contains the fields shown in [Table 5-32](#):

**Table 5-32 ALV\_REQUEST\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .

## GK\_WRITE\_MSG

The GK\_WRITE\_MSG structure is used to process responses from the external application to the Cisco IOS Gatekeeper.

This structure contains the fields shown in [Table 5-33](#):

**Table 5-33 GK\_WRITE\_MSG**

Field	Field Type	Description
msgType	Enumeration	See <a href="#">RESPONSE_MSG_TYPE</a> .
arqRespMsg	Structure	See <a href="#">ARQ_RESPONSE_MSG</a> .
acfRespMsg	Structure	See <a href="#">ACF_RESPONSE_MSG</a> .
arjRespMsg	Structure	See <a href="#">ARJ_RESPONSE_MSG</a> .
rrqRespMsg	Structure	See <a href="#">RRQ_RESPONSE_MSG</a> .
rrjRespMsg	Structure	See <a href="#">RRJ_RESPONSE_MSG</a> .
rcfRespMsg	Structure	See <a href="#">RCF_RESPONSE_MSG</a> .
lrqRespMsg	Structure	See <a href="#">LRQ_RESPONSE_MSG</a> .
lcfRespMsg	Structure	See <a href="#">LCF_RESPONSE_MSG</a> .
lrjRespMsg	Structure	See <a href="#">LRJ_RESPONSE_MSG</a> .
ripRespMsg	Structure	See <a href="#">RIP_RESPONSE_MSG</a> .

## ARQ\_RESPONSE\_MSG

The ARQ\_RESPONSE\_MSG structure is used to process ARQ responses from the external application. This structure contains the fields shown in [Table 5-34](#):

**Table 5-34 ARQ\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint.
destCallSignalAddress	Character string	Transport address used at the destination for call signaling.
destExtraCallInfo	Character string	External addresses for multiple calls.
bandWidthPresent	Boolean	Whether a specified bandwidth is present in the request.
bandWidth	Unsigned integer	Bandwidth (in 100 kbps) requested for the bidirectional call.
redirectNumber	Character string	Taken from the Number Digits field of Q.931 Setup Redirecting Number IE.
redirectReason	Enumeration	Taken from the Q.931 Setup Redirecting Number IE. See <a href="#">REDIRECT_REASON_TYPE</a> .

**Table 5-34** *ARQ\_RESPONSE\_MSG (continued)*

Field	Field Type	Description
displayIE	Character String	Taken from the Q.931 Setup, display IE.
srcCarrierID	Character String	Change source carrier ID to this value
dstCarrierInfo	Pointer	Information about destination carrier
srcInfo	Character String	Identifies the service provider offering the VoIP call to the gateway
rzone	Pointer	Remote zone information to which the gateway can LRQ to
final	Boolean	Do not propagate this message onward
gtd	Character String	Generic Transparency Descriptor. Defines parameters and messages of existing SS7 ISUP protocols
serviceCntrl	Parameter	See <a href="#">SERV_CNTRL_TYPE</a> .

## ACF\_RESPONSE\_MSG

The ACF\_RESPONSE\_MSG structure is used to process ACF responses from the external application. This structure contains the fields shown in [Table 5-35](#):

**Table 5-35** *ACF\_RESPONSE\_MSG*

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint.
destCallSignalAddress	Character string	Transport address used at the destination for call signaling.
destExtraCallInfo	Character string	External addresses for multiple calls.
rmotExtensionAddr	Character string	Alias address of a called endpoint, present in cases where this information is required to traverse multiple gateways.
bandWidthPresent	Boolean	Whether a specified bandwidth is present in the request.
bandWidth	Unsigned integer	Bandwidth (in 100 kbps) requested for the bidirectional call.
destinationType	Enumeration	Type of destination endpoint. See <a href="#">ENDPOINT_TYPE</a> .
altEndpt	Structure	See <a href="#">ALTERNATE_ENDPOINT</a> .
clearToken	Pointer	See <a href="#">CLEAR_TOKEN</a> .
altTranspAddr	Pointer	See <a href="#">ALTERNATE_TRANSPORT_ADDR_TYPE</a> .
use_transport	Enumeration	See <a href="#">USE_SPECIFIED_TRANSPORT_TYPE_T</a> .
dstCarrierInfo	Pointer	Information about the destination carrier
srcTrunkGroup	Character String	Change source trunk group ID to this value

**Table 5-35** *ACF\_RESPONSE\_MSG (continued)*

Field	Field Type	Description
dstTrunkInfo	Pointer	Information about the destination trunk group
serviceDescriptor	Parameter	See <a href="#">SERV_CNTRL_TYPE</a> .
gtd	Character String	Generic Transparency Descriptor. Defines parameters and messages of existing SS7 ISUP protocols

## ARJ\_RESPONSE\_MSG

The ARJ\_RESPONSE\_MSG structure is used to process ARJ responses from the external application. This structure contains the fields shown in [Table 5-36](#):

**Table 5-36** *ARJ\_RESPONSE\_MSG*

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
rejectReason	Enumeration	Reason the request was rejected. See <a href="#">ARJ_REJECT_REASON_TYPE</a> .
terminationCause	Character String	Informs the GKTMP server of the release complete Cause IE that was sent to the gatekeeper. See <a href="#">TERMINATION_CAUSE_TYPE</a> .

## RRQ\_RESPONSE\_MSG

The RRQ\_RESPONSE\_MSG structure is used to process RRQ responses from the external application. This structure contains the fields shown in [Table 5-37](#):

**Table 5-37** *RRQ\_RESPONSE\_MSG*

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
terminalAlias	Character string	List of alias addresses by which other terminals can identify this terminal.
supportedPrefix	Character string	Prefix associated with the supported protocol.
final	Boolean	Do not propagate this message onward

## RCF\_RESPONSE\_MSG

The RCF\_RESPONSE\_MSG structure is used to process RCF responses from the external application. This structure contains the fields shown in [Table 5-38](#):

**Table 5-38 RCF\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
terminalAlias	Character string	List of alias addresses by which other terminals can identify this terminal.
supportedPrefix	Character string	Prefix associated with the supported protocol.
alternateGK	Structure	See <a href="#">ALTERNATE_GK</a> .

## RRJ\_RESPONSE\_MSG

The RRJ\_RESPONSE\_MSG structure is used to process RRJ responses from the external application. This structure contains the fields shown in [Table 5-39](#):

**Table 5-39 RRJ\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
rejectReason	Enumeration	Reason the request was rejected. See <a href="#">RRJ_REJECT_REASON_TYPE</a> .

## LRQ\_RESPONSE\_MSG

The LRQ\_RESPONSE\_MSG structure is used to process LRQ responses from the external application. This structure contains the fields shown in [Table 5-40](#):

**Table 5-40 LRQ\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint.
srcCarrierID	Character String	Change source carrier ID to this value
dstCarrierInfo	Pointer	Information about destination carrier
srcInfo	Character String	Identifies the service provider offering the VoIP call to the gateway
rzone	Pointer	Remote zone information to which the gateway can LRQ to
final	Boolean	Do not propagate this message onward

**Table 5-40** *LRQ\_RESPONSE\_MSG (continued)*

Field	Field Type	Description
srcTrunkGroup	Character String	Source trunk group identifier of an outbound call
gtd	Character String	Generic Transparency Descriptor. Defines parameters and messages of existing SS7 ISUP protocols

## LCF\_RESPONSE\_MSG

The LCF\_RESPONSE\_MSG structure is used to process LCF responses from the external application. This structure contains the fields shown in [Table 5-41](#):

**Table 5-41** *LCF\_RESPONSE\_MSG*

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
destinationInfo	Character string	Sequence of alias addresses for the destination endpoint.
destExtraCallInfo	Character string	External addresses for multiple calls.
callSignalAddress	Character string	Call signaling transport address for this endpoint.
rasAddress	Character String	Registration and status transport address for this endpoint.
rmtExtensionAddr	Character String	Alias address of a called endpoint, present in cases where this information is required to traverse multiple gateways.
destinationType	Enumeration	Type of destination endpoint. See <a href="#">ENDPOINT_TYPE</a> .
altTranspAddr	Pointer	See <a href="#">ALTERNATE_TRANSPORT_ADDR_TYPE</a> .
dstCarrierInfo	Pointer	Information about destination carrier
gtd	Character String	Generic Transparency Descriptor. Defines parameters and messages of existing SS7 ISUP protocols
serviceDescriptor	Parameter	See <a href="#">SERV_CNTRL_TYPE</a> .

## LRJ\_RESPONSE\_MSG

The LRJ\_RESPONSE\_MSG structure is used to process LRJ responses from the external application. This structure contains the fields shown in [Table 5-42](#):

**Table 5-42** *LRJ\_RESPONSE\_MSG*

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .

**Table 5-42 LRJ\_RESPONSE\_MSG (continued)**

Field	Field Type	Description
rejectReason	Enumeration	Reason the request was rejected. See <a href="#">LRJ_REJECT_REASON_TYPE</a> .
terminationCause	Character String	Informs the GKTMP server of the release complete Cause IE that was sent to the gatekeeper. See <a href="#">TERMINATION_CAUSE_TYPE</a> .

## BRQ\_RESPONSE\_MSG

The BRQ\_RESPONSE\_MSG structure is used to process BRQ responses from the external application. This structure contains the fields shown in [Table 5-43](#):

**Table 5-43 BRQ\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
bandWidth	Unsigned integer	Bandwidth (in 100 kbps) requested for the bidirectional call.

## BCF\_RESPONSE\_MSG

The BCF\_RESPONSE\_MSG structure is used to process BCF responses from the external application. This structure contains the fields shown in [Table 5-44](#):

**Table 5-44 BCF\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
bandWidth	Unsigned integer	Bandwidth (in 100 kbps) requested for the bidirectional call.

## BRJ\_RESPONSE\_MSG

The BRJ\_RESPONSE\_MSG structure is used to process BRJ responses from the external application. This structure contains the fields shown in [Table 5-45](#):

**Table 5-45 BRJ\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
rejectReason	Enumeration	See <a href="#">BRJ_REJECT_REASON_TYPE</a> .

## ALV\_RESPONSE\_MSG

The ALV\_RESPONSE\_MSG structure is used to process ALV responses from the external application. This structure contains the fields shown in [Table 5-46](#):

**Table 5-46 ALV\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .

## CRYPTO\_H323\_TOKEN

The CRYPTO\_H323\_TOKEN structure is used to process cryptoTokens. This structure contains the fields shown in [Table 5-47](#):

**Table 5-47 CRYPTO\_H323\_TOKEN**

Field	Field Type	Description
token_type	Enumeration	See <a href="#">CRYPTO_H323_TOKEN_TYPE_S</a> .
cryptoEPPwdHash	Structure	See <a href="#">CRYPTO_EP_PWD_HASH</a> .
cryptoEPPwdEncr	Structure	See <a href="#">CRYPTO_EP_PWD_ENCR</a> .
cryptoEPCert	Structure	See <a href="#">CRYPTO_EP_CERT</a> .

## CRYPTO\_EP\_PWD\_HASH

The CRYPTO\_EP\_PWD\_HASH structure is used to process cryptoTokens. This structure contains the sections shown in [Table 5-48](#):

**Table 5-48 CRYPTO\_EP\_PWD\_HASH**

Field	Field Type	Description
alias	Character string	Registration and status transport address for this endpoint.
timestamp	Character string	32-bit integer that represents UTC time.
token	Character string	16 octet IA5String that represents the MD5 hashed encoded PwdCertToken.

## CRYPTO\_EP\_PWD\_ENCR

The CRYPTO\_EP\_PWD\_ENCR structure is used to process the encrypted data of a cryptoToken. This structure contains the fields shown in [Table 5-49](#):

**Table 5-49 CRYPTO\_EP\_PWD\_ENCR**

Field	Field Type	Description
paramS	Character string	Any runtime parameters.
encryptedData	Character string	Encrypted data from the cryptoToken.

## CRYPTO\_EP\_CERT

The CRYPTO\_EP\_CERT structure is used to process the authentication certificate of a cryptoToken. This structure contains the fields shown in [Table 5-50](#):

**Table 5-50 CRYPTO\_EP\_CERT**

Field	Field Type	Description
toBeSigned	Character string	Whether the certificate requires a signature.
signature	Character string	Digital signature assigned to the authentication certificate.

## CLEAR\_TOKEN

The CLEAR\_TOKEN structure is used to process the clear tokens field. This structure contains the fields shown in [Table 5-51](#):

**Table 5-51 CLEAR\_TOKEN**

Field	Field Type	Description
objectIdentifier	Character string	Object identifier.
password	Character string	Secret character string that is used to authenticate a user or H.323 endpoint.
timestamp	Character string	32-bit integer that represents UTC time.
challengeString	Character string	Challenge string used for authentication.
random	Character string	Integer value, for example a monotonically increasing sequence number.
generalID	Character string	Character string that uniquely identifies either the sender or receiver.
nonstd_objectID	Character string	Object identifier that is used to indicate the type and format of the nonstandard data being sent in the clear token.
nonstd_data	Character string	Nonstandard data in the clear tokens field.

## ALTERNATE\_GK

The ALTERNATE\_GK structure is used to process information about an alternate gatekeeper. This structure contains the fields shown in [Table 5-52](#):

**Table 5-52 ALTERNATE GK**

Field	Field Type	Description
rasAddress	Character string	Registration and status transport address for this endpoint.
gkIdentifier	Character string	Identifier of the gatekeeper.
needToRegister	Boolean	Whether there is a need to register with this gatekeeper.
priority	Integer	Priority of this gatekeeper. Possible values are 1 through 127.

## ALTERNATE\_ENDPOINT

The ALTERNATE\_ENDPOINT structure is used to process information about an alternate H.323 endpoint.

This structure contains the fields shown in [Table 5-53](#):

**Table 5-53 ALTERNATE\_ENDPOINT**

Field	Field Type	Description
callSignalAddress	Character string	Registration and status transport address for this endpoint.
tokenP	Structure	See <a href="#">CLEAR_TOKEN</a> .
carrierID	Character string	Carrier identifier
destinationTrunkGroupLabel	Character string	Outgoing trunk group identifier

## ALTERNATE\_TRANSPORT\_ADDR\_TYPE

The ALTERNATE\_TRANSPORT\_ADDR\_TYPE structure is used to convey information about an Annex E transport address of the destination H.323 endpoint. This structure contains the fields shown in [Table 5-54](#):

**Table 5-54 ALTERNATE\_TRANSPORT\_ADDR\_TYPE**

Field	Field Type	Description
annexE	Character string	Annex E transport address of the destination endpoint.
nextP	Pointer	Pointer to the next node in the linked list.

## RIP\_RESPONSE\_MSG

The RIP\_RESPONSE\_MSG structure is used to process requests from the external application for additional time. This structure contains the fields shown in [Table 5-55](#):

**Table 5-55 RIP\_RESPONSE\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .
delay	Integer	Amount of time, in milliseconds (1 through 65,536), that the endpoint should wait before retrying the request.

## UNSUPPORTED\_MSG

The UNSUPPORTED\_MSG structure is used to process requests from the Cisco IOS Gatekeeper that contain a RAS message type that is not supported by the API. This structure contains the field shown in [Table 5-56](#):

**Table 5-56 UNSUPPORTED\_MSG**

Field	Field Type	Description
headerInfo	Structure	See <a href="#">HEADER_INFO</a> .

## SERV\_CNTRL\_TYPE

[Table 5-57](#) shows the fields for the SERV\_CNTRL\_TYPE structure:

**Table 5-57 SERV\_CNTRL\_TYPE**

Field	Field Type	Description
serviceDescriptor	Character String	Code for use in authentication with RADIUS server by endpoint
reason	Character String	Indicates whether this is a new session (open), a modification to an existing session (refresh), or that the session is being terminated by the provider (close) and existing resources, such as a GUI, should be closed.
sessionId	Unsigned Integer	Integer that identifies the current session. This integer is unique for each client.  <b>Note</b> Identifiers received through different signaling paths may overlap.

## URQ\_CMD\_MSG\_TYPE

Table 5-58 shows the fields for the URQ\_CMD\_MSG\_TYPE structure:

**Table 5-58 URQ\_CMD\_MSG\_TYPE**

Field	Field Type	Description
callSignalAddress	Character String	Call signaling address of the endpoint to unregister.
urqReason	Enumeration	See <a href="#">URQ_REASON_TYPE</a> .
altGK	Pointer	Alternate gatekeeper information.

## URQ\_RESULT\_MSG

Table 5-59 shows the fields for the URQ\_RESULT\_MSG structure:

**Table 5-59 URQ\_RESULT\_MSG**

Field	Field Type	Description
callSignalAddress	Character String	Call signaling address of the unregistered endpoint.

## CALL\_CAPACITY

Table 5-60 shows the fields for the CALL\_CAPACITY structure:

**Table 5-60 CALL\_CAPACITY**

Field	Field Type	Description
call_protocol	Pointer	Defines the protocol supported by the endpoint for the call
calls_available	Pointer	Provides call statistics

## CALLS\_AVAILABLE

Table 5-61 shows the fields for the CALLS\_AVAILABLE structure:

**Table 5-61 CALLS\_AVAILABLE**

Field	Field Type	Description
groupID	Character String	Name of the carrier or service provider
bit_mask	Unsigned Character	Used to present either maximum or current calls available
max_call_available	Integer	Maximum calls available
current_calls_available	Integer	Current calls available

## CARRIER\_INFO

Table 5-62 shows the fields for the CARRIER\_INFO structure:

**Table 5-62 CARRIER\_INFO**

Field	Field Type	Description
dstCarrierID	Character String	Target carrier identifier of an outbound call
destinationInfo	Character String	Identifies the service provider offering the VoIP call to the gateway
sourceInfo	Character String	Identifies the service provider offering the VoIP call to the gateway
priority	Integer	Priority associated with the carrier
rzone	Pointer	Remote zone information to which the gateway can LRQ to

## PER\_CALLINFO

Table 5-63 shows the fields for the PER\_CALLINFO structure:

**Table 5-63 PER\_CALLINFO**

Field	Field Type	Description
callIdentifier	Character String	Call Identifier of the call
conferenceID	Character String	Conference identifier for the call
originator	Boolean	Whether the sender was the originator of the call
bandWidth	Unsigned Integer	Bandwidth (in 100 kpbs) requested for a bidirectional call
startTime	Unsigned Long	Start time of the call
srcZone	Character String	Source zone for the call
dstZone	Character String	Destination zone for the call
srcCarrierID	Character String	Source carrier identifier of the call
dstCarrierID	Character String	Destination carrier identifier for the call
sourceTrunk	Character String	Source trunk group identifier of the call
destTrunk	Character String	Destination trunk group identifier for the call

## REMOTE\_ZONE

Table 5-64 shows the fields for the REMOTE\_ZONE structure:

**Table 5-64 REMOTE\_ZONE**

Field	Field Type	Description
rasAddress	Character String	Registration and status address for the remote gatekeeper
cost	Unsigned Integer	Cost factor associated with the remote zone
priority	Unsigned Integer	Priority associated with the remote zone

## TERMINATION\_CAUSE\_TYPE

Table 5-65 shows the fields for the TERMINATION\_CAUSE\_TYPE structure:

**Table 5-65** TERMINATION\_CAUSE\_TYPE

Field	Field Type	Description
codingStd	Unsigned Integer	Coding standard
location	Unsigned Integer	Location
recommend	Unsigned Integer	Recommendation
relCause	Unsigned Integer	Cause value
diag0	Unsigned Integer	Diagnostic
diag1	Unsigned Integer	Diagnostic
diag2	Unsigned Integer	Diagnostic
relReason	Unsigned Integer	Reason value

# Enumerations

Some of the API structures contain enumerations. An enumeration is simply a list of possible values. This section lists the enumerations used by the structures and includes the following sections:

- [STATUS\\_TYPE](#), page 5-43
- [REG\\_STATUS\\_TYPE](#), page 5-44
- [ENDPOINT\\_TYPE](#), page 5-44
- [REDIRECT\\_REASON\\_TYPE](#), page 5-44
- [DRQ\\_REASON\\_TYPE](#), page 5-45
- [LRJ\\_REJECT\\_REASON\\_TYPE](#), page 5-45
- [REQUEST\\_MSG\\_TYPE](#), page 5-45
- [RRJ\\_REJECT\\_REASON\\_TYPE](#), page 5-46
- [ARJ\\_REJECT\\_REASON\\_TYPE](#), page 5-46
- [BRJ\\_REJECT\\_REASON\\_TYPE](#), page 5-47
- [URQ\\_REASON\\_TYPE](#), page 5-47
- [RESPONSE\\_MSG\\_TYPE](#), page 5-47
- [REGISTER\\_MSG\\_TYPE](#), page 5-48
- [REPORT\\_DEST\\_T](#), page 5-48
- [CRYPTO\\_H323\\_TOKEN\\_TYPE\\_S](#), page 5-48
- [USE\\_SPECIFIED\\_TRANSPORT\\_TYPE\\_T](#), page 5-48

## STATUS\_TYPE

The STATUS\_TYPE enumeration lists the possible return values from calls to read, write, register and unregister functions. The possible values are:

- PROCESSING\_SUCCESSFUL
- CONNECT\_IN\_PROGRESS
- NULL\_POINTER\_PASSED
- TCP\_HANDLE\_ERROR
- TCP\_CONNECT\_ERROR
- TCP\_READ\_ERROR
- TCP\_BIND\_ERROR
- TCP\_LISTEN\_ERROR
- TCP\_ADDRESS\_ALREADY\_IN\_USE
- TCP\_ADDRESS\_NOT\_AVAIL
- TCP\_NONBLOCK\_ERROR
- MEM\_ALLOC\_FAIL
- MSG\_READ\_ERROR
- TCP\_WRITE\_ERROR

- TCP\_CONNECTION\_CLOSED
- INCOMPLETE\_MSG\_READ
- INVALID\_MSG\_SPECIFIED
- INVALID\_ENDPOINT\_SPECIFIED
- INVALID\_REDIRECT\_REASON\_SPECIFIED
- INVALID\_REJECT\_REASON\_SPECIFIED
- INVALID\_DELAY\_SPECIFIED
- HEADER\_INFO\_INCOMPLETE

## REG\_STATUS\_TYPE

The REG\_STATUS\_TYPE enumeration lists the possible status values for registration and unregistration responses received from the Cisco IOS Gatekeeper. The possible values are:

- SUCCESSFUL
- INVALID\_PRIORITY
- INVALID\_FILTERS
- INVALID\_GKID

## ENDPOINT\_TYPE

The ENDPOINT\_TYPE enumeration lists the possible types of endpoints. The possible values are:

- GATEKEEPER
- TERMINAL
- MCU
- PROXY
- VOICEGATEWAY
- H320GATEWAY
- OTHERGATEWAY
- ENDPOINT\_INFO\_NOT\_RCVD

## REDIRECT\_REASON\_TYPE

The REDIRECT\_REASON\_TYPE enumeration lists the possible reasons that a call might be redirected. The possible values are:

- REDIRECT\_REASON\_UNKNOWN = 0
- REDIRECT\_REASON\_CALL\_FWD\_BUSY = 1
- REDIRECT\_REASON\_CALL\_FWD\_NO\_REPLY = 2
- REDIRECT\_REASON\_CALL\_DEFLECTION = 4
- REDIRECT\_REASON\_CLED\_DTE\_OUT\_OF\_ORDER = 9

- REDIRECT\_REASON\_CALL\_FWDING\_BY\_CLED\_DTE = 10
- REDIRECT\_REASON\_CALL\_FWDING\_UNCONDNL = 15
- REDIRECT\_REASON\_INFO\_NOT\_RCVD= 99

## DRQ\_REASON\_TYPE

The DRQ\_REASON\_TYPE enumeration lists the reasons received for a DRQ sent by an endpoint. The possible values are:

- DRQ\_REASON\_FORCED\_DROP = 1
- DRQ\_REASON\_NORMAL\_DROP = 2
- DRQ\_REASON\_UNDEF\_REASON = 3

## LRJ\_REJECT\_REASON\_TYPE

The LRJ\_REJECT\_REASON\_TYPE enumeration lists the possible reasons that an LRQ request might be rejected. The possible values are:

- LRJ\_NOT\_REGISTERED
- LRJ\_INVALID\_PERMISSION
- LRJ\_REQUEST\_DENIED
- LRJ\_UNDEFINED\_REASON
- LRJ\_SECURITY\_DENIAL

## REQUEST\_MSG\_TYPE

The REQUEST\_MSG\_TYPE enumeration lists the possible messages that can be received from the Cisco IOS Gatekeeper. The possible values are:

- UNKNOWN\_MSG
- MSG\_NOT\_SUPPORTED
- RRQ\_REQUEST\_MSG
- URQ\_REQUEST\_MSG
- ARQ\_REQUEST\_MSG
- LRQ\_REQUEST\_MSG
- LRJ\_REQUEST\_MSG
- LCF\_REQUEST\_MSG
- BRQ\_REQUEST\_MSG
- RAI\_REQUEST\_MSG
- DRQ\_REQUEST\_MSG
- RRQ\_REGISTER\_RESPONSE\_MSG
- URQ\_REGISTER\_RESPONSE\_MSG

- ARQ\_REGISTER\_RESPONSE\_MSG
- LRQ\_REGISTER\_RESPONSE\_MSG
- LCF\_REGISTER\_RESPONSE\_MSG
- LRJ\_REGISTER\_RESPONSE\_MSG
- BRQ\_REGISTER\_RESPONSE\_MSG
- RAI\_REGISTER\_RESPONSE\_MSG
- DRQ\_REGISTER\_RESPONSE\_MSG
- RRQ\_UNREGISTER\_RESPONSE\_MSG
- URQ\_UNREGISTER\_RESPONSE\_MSG
- ARQ\_UNREGISTER\_RESPONSE\_MSG
- LRQ\_UNREGISTER\_RESPONSE\_MSG
- LCF\_UNREGISTER\_RESPONSE\_MSG
- LRJ\_UNREGISTER\_RESPONSE\_MSG
- BRQ\_UNREGISTER\_RESPONSE\_MSG
- RAI\_UNREGISTER\_RESPONSE\_MSG
- DRQ\_UNREGISTER\_RESPONSE\_MSG

## RRJ\_REJECT\_REASON\_TYPE

The RRJ\_REJECT\_REASON\_TYPE enumeration lists the possible reasons that an RRQ request might be rejected. The possible values are:

- RRJ\_UNDEFINED\_REASON
- RRJ\_SECURITY\_DENIAL
- RRJ\_RESOURCE\_UNAVAIL

## ARJ\_REJECT\_REASON\_TYPE

The ARJ\_REJECT\_REASON\_TYPE enumeration lists the possible reasons that an ARQ request might be rejected. The possible values are:

- CALLED\_PARTY\_NOT\_REGISTERED
- INVALID\_PERMISSION
- REQUEST\_DENIED
- UNDEFINED\_REASON
- ARJ\_RESOURCE\_UNAVAIL
- ARJ\_SECURITY\_DENIAL

## BRJ\_REJECT\_REASON\_TYPE

The BRJ\_REJECT\_REASON\_TYPE enumeration lists the possible reasons that a BRQ request might be rejected. The possible values are:

- BRJ\_NOT\_BOUND
- BRJ\_INVALID\_CONF\_ID
- BRJ\_INVALID\_PERMISSION
- BRJ\_INSUFFICIENT\_RSC
- BRJ\_INVALID\_REVISION
- BRJ\_UNDEFINED\_REASON
- BRJ\_SECURITY\_DENIAL

## URQ\_REASON\_TYPE

The URQ\_REASON\_TYPE enumeration lists the reasons sent in the URQ message to unregister an endpoint. The possible values are:

- URQ\_REASON\_REREG\_REQ = 1
- URQ\_REASON\_TTL\_EXP = 2
- URQ\_REASON\_SEC\_DNL = 3
- URQ\_REASON\_UNDEF = 4
- URQ\_REASON\_MAINTENANCE = 5
- URQ\_REASON\_NOT\_SPECIFIED = 99

## RESPONSE\_MSG\_TYPE

The RESPONSE\_MSG\_TYPE enumeration lists the possible messages that the external application can send to the Cisco IOS Gatekeeper. The possible values are:

- RRQ\_RESPONSE\_MSG
- RCF\_RESPONSE\_MSG
- RRJ\_RESPONSE\_MSG
- ARQ\_RESPONSE\_MSG
- ACF\_RESPONSE\_MSG
- ARJ\_RESPONSE\_MSG
- LRQ\_RESPONSE\_MSG
- LCF\_RESPONSE\_MSG
- LRJ\_RESPONSE\_MSG
- RIP\_RESPONSE\_MSG
- BRQ\_RESPONSE\_MSG
- BCF\_RESPONSE\_MSG
- BRJ\_RESPONSE\_MSG

## REGISTER\_MSG\_TYPE

The REGISTER\_MSG\_TYPE enumeration lists the possible registration messages that the external application can send to the Cisco IOS Gatekeeper. The possible values are:

- RRQ\_REGISTER\_MSG
- URQ\_REGISTER\_MSG
- ARQ\_REGISTER\_MSG
- LRQ\_REGISTER\_MSG
- LCF\_REGISTER\_MSG
- LRJ\_REGISTER\_MSG
- BRQ\_REGISTER\_MSG
- RAI\_REGISTER\_MSG
- DRQ\_REGISTER\_MSG

## REPORT\_DEST\_T

The REPORT\_DEST\_T enumeration lists the possible destinations for the Gatekeeper API debug output. The possible values are:

- REPORT\_CONSOLE
- REPORT\_SYSLOG

## CRYPTO\_H323\_TOKEN\_TYPE\_S

The CRYPTO\_H323\_TOKEN\_TYPE\_S enumeration lists the possible types of cryptoTokens. The possible values are:

- NO\_CRYPTOTOKEN
- CRYPTO\_EP\_PWD\_HASH
- CRYPTO\_EP\_PWD\_ENCR
- CRYPTO\_EP\_CERT

**Note**

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In the first release of the GKTMP and API, the CRYPTO\_EP\_PWD\_HASH is the only type of cryptoToken supported.

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## USE\_SPECIFIED\_TRANSPORT\_TYPE\_T

The USE\_SPECIFIED\_TRANSPORT\_TYPE\_T enumeration lists the possible transport types that an endpoint can select for H.225 signalling. The possible values are:

- TRANSPORT\_NONE
- ANNEX\_E
- TCP

## CMD\_MSG\_TYPE

The CMD\_MSG\_TYPE enumeration lists the possible messages that the external application can send as spontaneous commands to the Cisco IOS Gatekeeper. The possible value is:

- URQ\_CMD\_MSG

## Limits

Some of the fields are limited in size. The limits are set using variables in the header file. The limits as set in the default header file are shown in [Table 5-66](#):

**Table 5-66 Field Size Limits**

Variable	Initial Value
MAX_IP_ADDR_LENGTH	15
MAX_VERSION_ID_LENGTH	4
MAX_ENDPOINT_LENGTH	128
MAX_TRANSACTION_ID_LENGTH	24
MAX_NUM_ENDPOINT_TYPES	7
MAX_NUM_SUPPORTED_PREFIX	10
MAX_NUM_ARQ_DEST_INFO	20
MAX_NUM_ARQ_REDIRECT_REASON	7
MAX_NUM_LRQ_DEST_INFO	20
MAX_NUM_LRQ_REDIRECT_REASON	7
MAX_NUM_LCF_DEST_INFO	20
MAX_NUM_LCF_RMOT_EXTENSION_ADDR	20
MAX_NUM_LRJ_DEST_INFO	20
MAX_CRYPT_TOKEN_FIELDS	5

