



Cisco TelePresence ISDN Gateway Remote Management API Reference Guide

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API history

The latest version of the Cisco TelePresence ISDN Gateway Remote Management API is version 2.6. The following Cisco TelePresence ISDN Gateway products support this API version when running software version 2.0, and later:

- ▶ ISDN GW 3241
- ▶ ISDN GW MSE 8310
- ▶ ISDN GW MSE 8321

The following table shows which version of Cisco TelePresence products support this version.

API Version	ISDN Gateway 3241, MSE 8310, MSE 8321
2.4	1.3
2.5	1.4, and later
2.6	2.0, and later

API version 2.6

Version 2.6 introduced the following changes:

XML-RPC request	Parameter	Addition/Deprecated	Page
auditlog.delete		Addition	12
auditlog.query		Addition	12
cdrlog.delete		Addition	15
cdrlog.query		Addition	15
device.query		Addition	19

Introduction

This reference guide contains the specification of the Cisco TelePresence ISDN Gateway Remote Management API, by which it is possible to control the following Cisco TelePresence products:

- ▶ ISDN GW 3241
- ▶ ISDN GW MSE 8310
- ▶ ISDN GW MSE 8321
- ▶ ISDN GW 3200 Series

This is accomplished via messages sent using the XML-RPC protocol. XML-RPC is a simple protocol for remote procedure calling using HTTP as the transport and XML as the encoding. It is designed to be as simple as possible, whilst allowing complex data structures to be transmitted, processed and returned. XML-RPC has no platform or software dependence and was chosen over SOAP because of its simplicity.

The interface is stateless. Currently, there is no mechanism for the Cisco TelePresence ISDN Gateway to call back the controlling application and therefore the controlling application must poll the ISDN gateway for status, as required. A future enhancement *may* provide a mechanism for signaling device status changes to the controlling application.

In this implementation of XML-RPC all parameters and return values are part of a <struct> and are explicitly named. For example, the device.query call returns the current time value as a structure member named 'currentTime' rather than as a single value of type <dateTime.iso8601>.

Note: Unless otherwise stated, assume string length is a maximum of 32 characters.

For further details of XML-RPC refer to the [specification](#) [1].

HTTP and HTTPS

Cisco TelePresence ISDN Gateways expect to receive HTTP communication over TCP/IP connections to port 80. The HTTP messages should be "POST"s to the URL "/RPC2".

HTTPS (a secure, encrypted version of HTTP) is supported on all Cisco TelePresence ISDN Gateway products from software version 1.4 and later.

By default, HTTPS is provided on TCP port 443, although Cisco TelePresence ISDN Gateways can be configured to receive HTTP and HTTPS connections on non-standard TCP port numbers if required.

The Cisco TelePresence ISDN Gateway implements HTTP/1.1 as defined by RFC 2616 [2].

Consider API overhead when writing applications

Every API command that your application sends incurs a processing overhead within the ISDN gateway's own application. The exact amount of overhead varies widely with the command type and the parameters sent. It is important to bear this in mind when designing your application's architecture and software. If the device receives a high number of API commands every second, its overall performance could be seriously impaired – in the same way that it would if several users accessed it from the web interface simultaneously.

For this reason, the best architecture is a single server running the API application and sending commands to the ISDN gateway. If multiple users need to use the application simultaneously, provide a web interface on that server or write a client that communicates with the server. The server would then manage the clients' requests and send API commands directly to the ISDN gateway. Implement some form of control in the API application on your server to prevent the ISDN gateway being

overloaded with API commands. This provides much more control than having the clients send API commands directly and will prevent the ISDN gateway's performance being impaired by unmanageable numbers of API requests

Protocol overview

Authentication

In order to manage the Cisco TelePresence ISDN Gateway, the controlling application must authenticate itself as a user with relevant privileges. Accordingly, each message contains a user name and password; see the section *Common* message elements below for details of the format. Note that authentication information is sent using plain text and should only be sent over a trusted network.

Note: All calls require administrator privileges.

Message flow

An application can send command messages to the ISDN gateway. For each command sent (provided the message is correctly formatted according to the [XML-RPC spec](#)), the ISDN gateway responds with a message indicating success or failure. The response message may also contain any data that was requested.

Command messages are sent in XML format. For example, the following message queries port 7 on a Cisco TelePresence ISDN Gateway:

```
POST /RPC2 HTTP/1.1
User-Agent: Frontier/5.1.2 (WinNT)
Host: 10.2.1.100
Content-Type: text/xml
Content-length: 402

<?xml version="1.0"?>
<methodCall>
<methodName>isdn.port.query</methodName>
<params>
<param>
<value><struct>
<member>
<name>authenticationPassword</name>
<value><string></string></value>
</member>
<member>
<name>port</name>
<value><int>7</int></value>
</member>
<member>
<name>authenticationUser</name>
<value><string>admin</string></value>
</member>
</struct></value>
</param>
</params>
</methodCall>
```

If the command was successful, the ISDN gateway sends a success response. Note that in the following example, some lines have been omitted at the ellipsis (...):

```
HTTP/1.1 200 OK
Connection: close
Content-Type: text/xml
Content-Length: 240

<?xml version="1.0"?>
<?xml version='1.0'?>
<methodResponse>
<params>
<param>
<value><struct>
<member>
<name>layer2</name>
<value><boolean>1</boolean></value>
</member>
<member>
<name>layer1</name>
<value><boolean>1</boolean></value>
</member>
<member>
<name>searchHighLow</name>
<value><boolean>0</boolean></value>
</member>
<member>
<name>enabled</name>
<value><boolean>1</boolean></value>
</member>
<member>
<name>lowChannel</name>
<value><int>1</int></value>
</member>
<member>
<name>mode</name>
<value><string>terminal</string></value>
</member>
<member>
<name>directoryNumber</name>
<value><string></string></value>
</member>
<member>
<name>bChannels</name>
<value><array><data>
<value><struct>
<member>
<name>incoming</name>
<value><boolean>1</boolean></value>
</member>
<member>
<name>calling</name>
<value><string></string></value>
</member>
<member>
<name>active</name>
<value><boolean>1</boolean></value>
</member>
</struct>
</data>
</array></value>
</member>
</params>
</methodResponse>
```

```

<name>voice</name>
<value><boolean>0</boolean></value>
</member>
<member>
<name>called</name>
<value><string>208201</string></value>
</member>
<member>
<name>channel</name>
<value><int>1</int></value>
</member>
</struct></value>
...
<value><struct>
<member>
<name>active</name>
<value><boolean>0</boolean></value>
</member>
<member>
<name>channel</name>
<value><int>31</int></value>
</member>
</struct></value>
</data></array></value>
</member>
<member>
<name>type</name>
<value><string>el</string></value>
</member>
<member>
<name>port</name>
<value><int>7</int></value>
</member>
<member>
<name>highChannel</name>
<value><int>31</int></value>
</member>
</struct></value>
</param>
</params>
</methodResponse>

```

If the command fails, for example, querying port 7 on a 4-port ISDN gateway, the gateway sends a fault response, for example:

```

HTTP/1.1 200 OK
Connection: close
Content-Type: text/xml
Content-Length: 411

<?xml version='1.0'?>
<methodResponse>
<fault>
<value><struct>
<member>
<name>faultCode</name>
<value><int>24</int></value>

```



```

</member>
<member>
<name>faultString</name>
<value><string>no such port</string></value>
</member>
</struct>
</value>
</fault>
</methodResponse>

```

The complete list of command messages, their required and optional parameters, and the expected responses are detailed in the sections below. The possible [fault codes](#) are listed later in this document.

Unicode support

Parameters in this version of the API can be in ASCII text or unicode (UTF-8). In order to distinguish between these encodings, any of several methods can be used. If no method is present, ASCII is assumed.

HTTP headers

There are two different ways of specifying unicode in the HTTP headers; either using "Accept-Encoding: utf-8", or modifying the Content-Type header to read "Content-Type: text/xml; charset=utf-8".

XML header

The `<?xml>` tag is required at the top of each XML file. This API will accept an additional encoding parameter with value UTF-8 for this tag, i.e. `<?xml version="1.0" encoding="UTF-8"?>`.

Common message elements

Authentication

All messages must contain a user name and password as follows:

Parameter	Type	Comments
authenticationUser	String	Name of a user with sufficient privilege for the operation being performed. The name is case sensitive.
authenticationPassword	String	The corresponding user's password. This parameter is ignored if the user has no password set. Note that this differs from the web interface where a blank password must be blank.

Note: All calls require administrator privileges.

Enumerate functions

Due to the potential for a very large number of responses, all enumerate functions return an enumerateID response. This contains a value which should be passed to subsequent calls of the same enumerate function in order to retrieve the remainder of the values.

The use of this parameter is as follows:

1. The client computer sends an enumerate call with any necessary parameters (e.g. operationScope) and no enumerateID parameter.
2. The ISDN gateway returns with an array containing the requested data, and possibly a new enumerateID.
3. If there is an enumerateID, the client will call the enumerate method again, with any parameters that are required or desired, and an enumerateID parameter containing the ID returned by the ISDN gateway from the previous call. This should be repeated while the ISDN gateway continues to provide new enumerateID values in responses.
4. After all data is returned, the ISDN gateway will reply with all remaining results, but no enumerateID.

This method should only be called using enumerateID values as provided by the ISDN gateway.

API reference

This section is a reference to each of the Cisco TelePresence ISDN Gateway API calls. For each API call, the following information is provided where applicable:

- ▶ Description of the call's function
- ▶ Parameters
- ▶ List of responses
- ▶ Response data types
- ▶ Structure formats
- ▶ Additional information that will assist in using the API call
- ▶ Parameters deprecated from previous versions

The table below lists all currently supported ISDN gateway API calls. Click on the call name to go to the page containing a complete description of the call.

- ▶ [auditlog.delete](#)
- ▶ [auditlog.query](#)
- ▶ [calls.active.enumerate](#)
- ▶ [calls.completed.enumerate](#)
- ▶ [cdrlog.delete](#)
- ▶ [cdrlog.query](#)
- ▶ [device.health.query](#)
- ▶ [device.network.query](#)
- ▶ [device.query](#)
- ▶ [device.restartlog.query](#)
- ▶ [isdn.port.query](#)

auditlog.delete

Deletes stored events from the CDR log.

Parameter	Type	Comments
deleteIndex	Integer	You can delete logs in chunks of 400 entries. To delete entries, you can enter the value returned after an auditlog.query call in deleteableIndex. This will delete all complete chunks (400 entries) below this value, leaving the residuals. Alternatively, you can delete fewer entries by entering a number below the value of deleteableIndex. This will delete all complete chunks (400 entries) below the entered number, leaving any residuals

Stored audit events up to and including the indicated deleteIndex will be permanently deleted.

auditlog.query

The call takes no parameters.

The response returns the following.

Response	Type	Comments
firstIndex	Integer	The index of the oldest stored audit event.
deleteableIndex	Integer	The index of the most recent deletable audit event.
numEvents	Integer	The total number of events stored.
percentageCapacity	Integer	The percentage of total available capacity used by the audit log.

calls.active.enumerate

Returns a list of all currently active calls on the ISDN gateway.

Parameter	Type	Comments
enumerateID (optional)	Integer	An enumerateID, as specified above .

This returns the following structure:

Response	Type	Comments
enumerateID (optional)	Integer	An enumerateID, as specified above .
calls	Array	See below for details.

The calls structure contains the following fields:

Field	Type	Comments
uniqueId	Integer	A unique identifier for this call.
participantOne	Struct	Structures containing participant information, as defined in common structures, above.
participantTwo	Struct	
startTime	dateTime.iso8601	The start time of the call.
voiceCall	Boolean	True if this is a voice-only call, false for a video call.
aggregationCall	Boolean	True if this is an aggregation call, false otherwise.
callProgress	String	The state of the call. One of: initial , callingOut , connected or dying .
encryption	String	Either all , some or none , depending on the current encryption state of the media channels (on the IP side of the call).
ISDN encryption	String	Either all , some or none , depending on the current encryption state of the media channels on the ISDN side of the call.
maxDuration	Integer	The maximum duration of this call in seconds. If there is no maximum, this value is 0.
calledNumber	String (length <=64 in r1.4, <=128 in 51.5)	The number originally called, or unknown if this number is unknown.
callDuration	Integer	The duration of the call in seconds.
callBandwidth	Integer	The bandwidth of the call in bits per second.

calls.completed.enumerate

Returns completed call information available in local memory. The information returned is the equivalent to the information on **Status** page and is limited to the last 100 calls.

This function takes no parameters.

Parameter	Type	Comments
enumerateID (optional)	Integer	An enumerateID, as specified above .

This returns the following structure:

Response	Type	Comments
enumerateID (optional)	Integer	An enumerateID, as specified above .
calls	Array	See below for details.

The array "calls" is a structure with the following fields:

Field	Type	Comments
uniqueId	Integer	A unique identifier for this call.
participantOne	Struct	Participant identification structures, as defined in common structures above.
participantTwo	Struct	
startTime	dateTime.iso8601	The start time of the call
endTime	dateTime.iso8601	The end time of the call.
voiceCall	Boolean	True if this is a voice-only call, false for a video call.
aggregationCall	Boolean	True if this is an aggregation call, false otherwise.
encryption	String	Either all , some or none , depending on the current encryption state of the media channels (on the IP side of the call).
ISDN encryption	String	Either all , some or none , depending on the current encryption state of the media channels on the ISDN side of the call.
maxDuration	Integer	The maximum duration of this call in seconds. If there is no maximum, this value is 0.
calledNumber	String	The number originally called, or unknown if this number is unknown.
callBandwidth	Integer	The bandwidth of the call in bits per second.

The calling and called party are as defined above.

cdrlog.delete

Deletes stored events from the CDR log.

Parameter	Type	Comments
deleteIndex	Integer	You can delete logs in chunks of 400 entries. To delete entries, you can enter the value returned after a cdrlog.query call in deleteableIndex. This will delete all complete chunks (400 entries) below this value, leaving the residuals. Alternatively, you can delete fewer entries by entering a number below the value of deleteableIndex. This will delete all complete chunks (400 entries) below the entered number, leaving any residuals

Stored audit events up to and including the indicated deleteIndex will be permanently deleted.

cdrlog.query

This call takes no parameters. The response returns the following:

Field	Type	Comments
firstIndex	Integer	The index of the oldest stored CDR event.
deleteableIndex	Integer	The index of the most recent deletable CDR event.
numEvents	Integer	Total number of events stored.
percentageCapacity	Integer	The percentage of total available capacity used by the CDR log.

device.health.query

Returns the current status of the ISDN gateway, such as health monitors and CPU load.

Response	Type	Comments
cpuLoad	Integer	The CPU load, as a percentage.
mediaLoad	Integer	Loads for the media processors (total, and split between audio and video) as percentage values.
audioLoad	Integer	
videoLoad	Integer	
temperatureStatus	String	One of ok, outOfSpec or critical.
temperatureStatusWorst	String	
rtcBatteryStatus	String	
rtcBatteryStatusWorst	String	
voltagesStatus	String	
voltagesStatusWorst	String	
operationalStatus	String	One of active, shuttingDown or shutDown.

device.network.query

This call takes no parameters. The response returns the following:

Parameter	Type	Comments
portA	Array (see below)	Contains the configuration and status for port A.
portB	Array (see below)	Contains the configuration and status for port B.

The format for the two structures above is:

Field	Type	Comments
enabled	Boolean	true if the port is enabled, otherwise false.
linkStatus	Boolean	true if the link is up, false if the link is down.
Speed	Integer	One of 10, 100 or 1000, in Mbps.
fullDuplex	Boolean	true if full duplex enabled, false if half.
macAddress	String	A 12 character string, no separators.
packetsSent	Integer	Stats from the web interface. It is worth noting that all these values are 32 bit signed integers, and thus may wrap.
packetsReceived	Integer	
multicastPacketsSent	Integer	
multicastPacketsReceived	Integer	
bytesSent	Integer	
bytesReceived	Integer	
queueDrops	Integer	
collisions	Integer	
transmitErrors	Integer	
receiveErrors	Integer	

Field	Type	Comments
bytesSent64	String	64 bit versions of the above stats, using a string rather than an integer.
bytesReceived64	String	
Optional parameters		
hostName	String	The host name of this port.
dhcp	Boolean	true if configured by DHCP, otherwise false .
ipAddress	String	a.b.c.d format.
subnetMask	String	a.b.c.d format.
defaultGateway	String	a.b.c.d format.
domainName	String	The domain name of this port.
nameServer	String	a.b.c.d format.
nameServerSecondary	String	a.b.c.d format.

All fields above marked optional will only be returned if the interface has been enabled and has been configured.

device.query

There are no parameters passed with this method call. The method response returns the following:

Parameter	Type	Comments
currentTime	dateTime.iso8601	The system's current time (UTC).
restartTime	dateTime.iso8601	The date and time at which the system was last restarted.
serial	String	The serial number of the ISDN gateway
softwareVersion	String	The software version of the running software.
buildVersion	String	The build version of the running software.
model	String	The model of this ISDN gateway, e.g. "..... ISDN GW 8321".
apiVersion	String	The version number of the API implemented by this ISDN gateway.
activatedFeatures	Array	Currently, only contains a string "feature" with a short description of the feature.
totalVideoPorts	Integer	The total number of video ports on the ISDN gateway.
totalAudioOnlyPorts	Integer	The total number of additional audio-only ports on the ISDN gateway.
maxVideoResolution	String	One of <code>cif</code> or <code>4cif</code> .

device.restartlog.query

Returns the restart log - also known as the system log on the web interface.

Response	Type	Comments
Log	Array	Contains the restart log in structures as described below.

The "Log" array consists of structures which contain the following fields.

Field	Type	Comments
Time	dateTime.iso8601	The time of the last reboot.
Reason	String	The reason for the reboot (one of unknown , User requested shutdown or User requested upgrade).

isdn.port.query

Returns the current status and the settings of an ISDN port: the device.query call returns the number of ports on the ISDN gateway.

Parameter	Type	Comments
port	Integer	The port number to query. This is zero based, so if there are four ports, they are numbered 0 to 3.

This function returns the following structure:

Response	Type	Comments
port	Integer	The port number.
type	String	The interface type. One of e1 , j1 , t1 or unknown .
mode	String	The interface mode. One of terminal , network or unknown .
layer1	Boolean	True if layer 1 is up, false otherwise.
layer2	Boolean	True if layer 2 is up, false otherwise.
enabled	Boolean	True if this port has been enabled.
bChannels	Array	Only present if layer2 is up. See below for details.
lowChannel	Integer	The index of the low channel.
highChannel	Integer	The index of the high channel.
searchHighLow	Boolean	True if the search order is high to low, false if the search order is low to high.
directoryNumber	String	The directory number of this port.

The bChannels structure has the following members:

Field	Type	Comments
id	Integer	The channel index.
active	Boolean	True if this channel is active.
voice	Boolean	True if this a voice call, false if a data call. Only present if active.
incoming	Boolean	True if this call is incoming, false if outgoing. Only present if active.

Field	Type	Comments
calling	String (length <64)	Only present if active.
called	String (length <64)	Only present if active.

This function will return a "No such port" fault (24) if the port requested does not exist.

Fault codes

The Cisco TelePresence gateways, MCUs and VCRs have a series of fault codes which are returned when a fault occurs during the processing of an XML-RPC request. While individual call descriptions above give some indication of which faults may occur, below is a description of all possible fault codes used within this specification and the most common interpretation. Note that not all codes are used by the Cisco TelePresence ISDN Gateway.

Fault Code	Description
1	Method not supported. This method is not supported on this device.
2	Duplicate conference name. A conference name was specified, but is already in use.
3	Duplicate participant name. A participant name was specified, but is already in use.
4	No such conference or auto attendant. The conference or auto attendant identification given does not match any conference or auto attendant.
5	No such participant. The participant identification given does not match any participants.
6	Too many conferences. The device has reached the limit of the number of conferences that can be configured.
7	Too many participants. There are already too many participants configured and no more can be created.
8	No conference name or auto attendant id supplied. A conference name or auto attendant identifier was required, but was not present.
9	No participant name supplied. A participant name is required but was not present.
10	No participant address supplied. A participant address is required but was not present.
11	Invalid start time specified. A conference start time is not valid.
12	Invalid end time specified. A conference end time is not valid.
13	Invalid PIN specified. A PIN specified is not a valid series of digits.
14	Unauthorised. The requested operation is not permitted on this device.
15	Insufficient privileges. The specified user id and password combination is not valid for the attempted operation.
16	Invalid enumerateID value. An enumerate ID passed to an enumerate method invocation was invalid. Only values returned by the device should be used in enumerate methods.
17	Port reservation failure. This is in the case that reservedAudioPorts or

Fault Code	Description
	reservedVideoPorts value is set too high, and the device cannot support this.
18	Duplicate numeric ID. A numeric ID was given, but this ID is already in use.
19	Unsupported protocol. A protocol was used which does not correspond to any valid protocol for this method. In particular, this is used for participant identification where an invalid protocol is specified.
20	Unsupported participant type. A participant type was used which does not correspond to any participant type known to the device.
21	No such folder. A folder identifier was present, but does not refer to a valid folder.
22	No such recording. A recording identifier was present, but does not refer to a valid recording.
23	No changes requested. This is given when a method for changing something correctly identifies an object, but no changes to that object are specified.
24	No such port. This is returned when an ISDN port is given as a parameter which does not exist on an ISDN gateway.
101	Missing parameter. This is given when a required parameter is absent. The parameter in question is given in the fault string in the format "missing parameter - <i>parameter_name</i> ".
102	Invalid parameter. This is given when a parameter was successfully parsed, is of the correct type, but falls outside the valid values; for example an integer is too high or a string value for a protocol contains an invalid protocol. The parameter in question is given in the fault string in the format "invalid parameter - <i>parameter_name</i> ".
103	Malformed parameter. This is given when a parameter of the correct name is present, but cannot be read for some reason; for example the parameter is supposed to be an integer, but is given as a string. The parameter in question is given in the fault string in the format "malformed parameter - <i>parameter_name</i> ".
201	Operation failed. This is a generic fault for when an operation does not succeed as required.

HTTP keep-alives

Note: This feature is available from API version 2.4 onwards.

A method of reducing the amount of TCP traffic when polling the ISDN gateway via the API is to use HTTP keep-alives. (This method can be used with other Cisco TelePresence products that also support the API, such as the MCU and IP VCR.)

Any client which supports HTTP keep-alives may include the following line in the HTTP header of an API request:

```
Connection: Keep-Alive
```

This indicates to the Cisco product that the client supports HTTP keep-alives. The ISDN gateway *may* then choose to not close the TCP connection after returning its response to the request. If the connection will be closed, the ISDN gateway returns the following line in the HTTP header of its response:

```
Connection: close
```

The absence of this line indicates that the ISDN gateway will keep the TCP connection open and that the client may use the same connection for a subsequent request.

The ISDN gateway will not allow a connection to be kept alive if:

- ▶ the current connection has already serviced a set number of requests
- ▶ the current connection has already been open for a certain amount of time
- ▶ there are already more than a certain number of connections in a “kept alive” state

These restrictions are in place to limit the resources associated with kept-alive connections. If a connection is terminated for either of the first two reasons, the client will probably find that the connection is back in a keep-alive state following the next request.

The client should never assume a connection will be kept alive.

Also note that, even after a response not containing the “connection: close” header, the connection will still be closed if no further requests are made within one minute. If requests from the client are likely to be this far apart then there is little to be gained by using HTTP keep-alives.

References

The following table lists documents and web sites referenced in this document. All product documentation can be found on our [web site](#).

[1]	XML-RPC, http://www.xmlrpc.com/
[2]	RFC 2616, http://www.faqs.org/rfcs/rfc2616.html

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