



Cisco TelePresence MCU Series API 2.8

Product Programming Reference Guide

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API version history

The latest version of the Cisco TelePresence MCU Remote Management API is version 2.8. This document refers to this as 'the API'. The following Cisco TelePresence MCU products support this version:

- ▶ MCU 4200 Series
- ▶ MCU 4500 Series
- ▶ MCU MSE 8420
- ▶ MCU MSE 8510

This document refers to the software that runs on these products as 'the MCU'.

The following table shows the device's software versions and the corresponding supported API versions:

API Version	MCU Version
2.8 (this version)	4.2 and later
2.7	4.1 and later

Version 2.8

New fault codes have been added to report problems with template calls. The following API calls have also been added or modified:

XML-RPC request	Parameter	Addition/Deprecated /Removed
addressBookEntry.enumerate	actAsRecorder addAsGuest cameraControl cameraControlDefault h239Negotiation layoutControlEx	New conferencing parameters returned by endpoints in the address book
cdrlog.enumerate		Added call
conference.create conference.modify	automaticLectureMode templateName templateNumber startLocked conferenceMeEnabled lastChairmanLeavesDisconnect cleanupTimeout preconfiguredParticipantsDeferred contentTxCodec contentTxMinimumBitRate cameraControl	Added parameters

conference.create conference.modify conference.enumerate conference.status	layoutControlEx	Updated control options
conference.enumerate	moreThanFour	New accept parameter
conference.enumerate conference.status	conferenceMeEnabled contentImportant contentTxCodec contentTxMinimumBitRate lastChairmanLeavesDisconnect preconfiguredParticipantsDeferred cameraControlDefault cameraControl automaticLectureMode	New conference return parameters
conference.resetCleanupTimeout		Added call
conferenceme.query	useWebService	New return parameter
device.network.query	New dns array with hostName nameServer nameServerSecondary domainName parameters Port arrays with ipv4Enabled ipv6Enabled ipv6Address ipv6PrefixLength defaultIpv6Gateway linkLocalIpv6Address linkLocalIpv6PrefixLength parameters	Added return parameters
device.query	videoPortAllocation	Return parameter values changed

gatekeeper.query	registrationType portAssociationA portAssociationB portAssociationAv6 portAssociationBv6 sendResourceAvailabilityIndications availabilityThresholdConferences availabilityThresholdVideoPorts registeredAddress alternateGatekeepers resourceAvailabilityStatus	Added return parameters
participant.add	addAsGuest actAsRecorder h239Negotiation	New parameters
participant.diagnostics	contentRxType contentRxCodec contentRxWidth contentRxHeight contentRxFrameRate contentRxActualBitRate contentRxChannelBitRate contentRxSelectedBitRate contentRxBitRateLimitReason contentRxJitter contentRxFramesReceived contentRxFramesReceivedWithErrors contentRxReceived contentRxLost contentTxType contentTxCodec contentTxWidth contentTxHeight contentTxFrameRate contentTxActualBitRate contentTxChannelBitRate contentTxSelectedBitRate contentTxBitRateLimitReason contentTxSent contentTxReportedLost contentTxError	Added return parameters
participant.enumerate participant.status	actAsRecorder guest remoteLinkType contentRxType contentRxCodec contentRxReceived contentRxLost contentTxType contentTxCodec contentTxSent contentTxReportedLost	Added return parameters

participant.add participant.enumerate participant.modify participant.status	layoutControlEx	Changed parameter
template.create		Call added
template.delete		Call added
template.modify	newTemplateName parent startLocked conferenceMeEnabled contentTxCodec contentTxMinimumBitRate cameraControl lastChairmanLeavesDisconnect preconfiguredParticipantsDefer useMaximumPortsFromParent enforceMaximumVideoPorts maximumVideoPorts maximumAudioPorts enforceMaximumAudioPorts useReservedPortsFromParent reserveVideoPorts reservedVideoPorts reserveAudioPorts reservedAudioPorts	Parameters added
template.modify template.enumerate template.status	layoutControlEx	Updated control options
services.query		Call added
sip.query	registrarUsage registrarType maxOcsBitrate outgoingTransport useLocalCertificate registrationStatus	Return values added

Version 2.7

Version 2.7 introduced the following changes:

XML-RPC request	Parameter	Addition/Deprecated /Removed
conference.create conference.modify conference.enumerate conference.status	suppressDtmfEx	Additional parameter
	layoutControlEx	Additional parameter

	dtmfMuteControl	Additional parameter
	automaticLectureModeEnabled	Additional parameter
	automaticLectureModeTimeout	Additional parameter
	encryptionRequired	Additional parameter
	contentContribution	Additional parameter
	contentTransmitResolutions	Additional parameter
	suppressDtmf	Removed parameter
	layoutControlEnabled	Deprecated parameter
participant.add participant.modify participant.enumerate participant.status	suppressDtmfEx	Additional parameter
	layoutControlEx	Additional parameter
	suppressDTMF	Removed parameter
	layoutControlEnabled	Deprecated parameter
participant.enumerate	lecturer	Additional parameter
	enumerateFilter	Additional parameter
template.modify		New call
template.status		New call
template.enumerate		New call

Version 2.6

Version 2.6 introduced the following changes:

XML-RPC request	Parameter	Addition/Deprecated
auditlog.delete		Addition

auditlog.query		Addition
autoAttendant.destroy		Addition
autoAttendant.status		Addition
cdrlog.delete		Addition
cdrlog.query		Addition
conference.status		Addition
device.query	totalStreamingAndContentPorts	Addition
participant.status		Addition

Introduction

This reference guide contains the specification of the Cisco TelePresence MCU Series API, by which it is possible to control the following Cisco TelePresence products:

- ▶ MCU 4200 Series
- ▶ MCU 4500 Series
- ▶ MCU MSE 8420
- ▶ MCU MSE 8510

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.

In this implementation of XML-RPC all parameters and return values are part of a <struct> and are all 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 31 characters.

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

HTTP and HTTPS

MCUs expect to receive HTTP communication over TCP/IP connections to port 80. The HTTP messages should be “POST”s to the URL “/RPC2”.

HTTPS (HTTP secured by SSL) is supported on all MCU products from software version 2.3 and later.

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

The MCUs implement HTTP/1.1 as defined by [RFC 2616](#) [2].

Clustering

From Version 4.1 of the MCU, it is possible to configure MCU blades in a cluster in order to increase the number of HD conference participants. One MCU acts as a master controlling up to two slave MCUs.

Consider API overhead when writing applications

Every API command that your application sends incurs a processing overhead within the device’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 be several users accessed it from the web interface simultaneously.

The current implementation of the MCU API will accept a maximum of four concurrent XML RPC requests and is limited to a maximum of eight concurrent TCP connections.

For this reason, the best architecture is a single server running the API application and sending commands to the device. 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 device. Implement some form of control in the API application on your server to prevent the device being overloaded with API commands. This provides much more control than having the clients send API commands directly and will prevent the device's performance being impaired by unmanageable numbers of API requests.

Furthermore, the API is designed to have as little impact as possible on the network when responding to requests. The device's responses do not routinely include data that is not relevant, or empty data structures where the data is not available. Your application should take responsibility for checking whether the response includes what you expected, and you should design it to gracefully handle any situations where the device does not respond with the expected data.

XML-RPC protocol overview

Message flow

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

Authentication

To manage the MCU, the controlling application must authenticate itself as a user with relevant privileges. Accordingly, each message contains a user name and password (for details see the *Common message elements* section below).



CAUTION: Authentication information is sent using plain text and should only be sent over a trusted network.

All calls require administrator privileges.

Example command message

Command messages are sent in XML format. For example, the following message schedules a conference on an MCU to begin at 10:45 on 18 February 2005 and last for one hour:

```
POST /RPC2 HTTP/1.1
User-Agent: Frontier/5.1.2 (WinNT)
Host: 10.2.1.100
Content-Type: text/xml
Content-length: 713
<?xml version="1.0"?>
<methodCall>
<methodName>conference.create</methodName>
<params>
<param>
<value>
<struct>
<member>
<name>authenticationUser</name>
<value>
<string>api_test</string>
</value>
</member>
<member>
<name>authenticationPassword</name>
<value>
<string>123456</string>
</value>
</member>
<member>
<name>conferenceName</name>
<value>
<string>Meeting 1</string>
</value>
```

```

</member>
<member>
<name>startTime</name>
<value>
<dateTime.iso8601>20050218T10:45:00</dateTime.iso8601>
</value>
</member>
<member>
<name>durationSeconds</name>
<value>
<int>3600</int>
</value>
</member>
</struct>
</value>
</param>
</params>
</methodCall>

```

If the command was successful, the MCU sends a success response. For example, in response to a `successful.conference.create` message, the MCU returns:

```

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

<?xml version="1.0"?>
<methodResponse>
<params>
<param>
<value>
<struct>
<member>
<name>status</name>
<value>
<string>operation successful</string>
</value>
</member>
</struct>
</value>
</param>
</params>
</methodResponse>

```

If the command fails, the MCU sends a fault response. For example, in response to a `conference.create` message where the conference name is not unique, the MCU returns:

```

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>2</int>
        </value>
      </member>
      <member>
        <name>faultString</name>
        <value>
          <string>duplicate conference name</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 [API reference](#). 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). You can distinguish between these encodings as follows; 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. The API will accept an `encoding` parameter for this tag with value UTF-8; that is `<?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 user's password. If there is no password stored against the corresponding username, any supplied value is accepted.

Participant identification parameters

The following parameters appear in the majority of conference control messages, and identify a specific participant on which operations are to be performed. The use of “MCU” below refers to any device which acts as a video conferencing server.

Parameter	Type	Comments
participantName	String	This is an “internal” name, and therefore is not necessarily related to any name configured on an endpoint. Within the scope of a particular conference or auto attendant, the combination of “participantType”, “participantProtocol” and “participantName” is always unique.
participantProtocol	String	Used in conjunction with “participantName” to uniquely identify a participant within a conference. Typically, these parameters should be treated as opaque values, but the current possibilities are: - for “participantProtocol”: h323 – an endpoint using the H.323 protocol vnc – a VNC connection (e.g. remote desktop) sip – an endpoint using the SIP protocol - for “participantType”: ad_hoc – this participant called into the MCU or was dialed out via the web interface and is not in the MCU's endpoint list by_address – fully-specified participant added through the API by_name – MCU-configured endpoint irrespective of whether the endpoint dialed in or the MCU dialed out API-created participants in scheduled conferences (i.e. those originated by “participant.add”) will be of type by_address (unless they are added explicitly as temporary ad_hoc participants.)
participantType	String	
conferenceName	String	Unique conference name – the conference name space is shared between API-generated conferences and all other ad hoc and scheduled MCU conferences.
autoAttendantUniqueld	String	If the participant in question is connected to an auto attendant rather than a conference, this field contains a unique identifier for that auto attendant.

When modifying or querying parameters for a specific endpoint, participantName, participantProtocol and participantType parameters are supplied, along with either a conferenceName or an autoAttendantUniqueld. The only safe way to find these values is to use the fields returned from participant.enumerate.

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 MCU 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 device from the previous call. This should be repeated while the MCU continues to provide new `enumerateID` values in responses.
4. After all data is returned, the MCU will reply with all remaining results, but no `enumerateID`.

This method should only be called using `enumerateID` values as provided by the MCU.

Filtering

Enumerate methods contain an optional `enumerateFilter` parameter, which can be used to restrict the responses to the enumerate call. The valid expressions depend on the method to which they are applied, but the syntax is the same for all enumerate functions: the section in this document for each call provides a list of valid filters for that call.

To use the filters, the expression is evaluated, with any method or expression symbols evaluated for the given entity being enumerated (e.g. if enumerating conferences, the *active* expression will evaluate to true if the conference is active, and false otherwise). If the result of evaluating the filter is true, the entity is returned to the client. If the expression evaluates to false, the entity in question is not returned to the client and the next entity (if any) is considered. As an example, if the expression (*active && scheduled*) is used when enumerating conferences, the returned conferences will be only those which are both active and scheduled.

Filters can consist of atomic expressions, joined together with operators, and brackets in the traditional manner. Whitespace is ignored. Methods are valid, and any parameters are in a comma separated list in brackets following the function name, for example **function(expression₁, expression₂)**.

From a Boolean perspective, the integer 0 is **false**, and all other numbers are **true**.

Integer values can be expressed using any string of valid digits, optionally prefixed by 0x for hexadecimal.

0t for decimal and 0z for binary. If no prefix is specified, decimal is assumed.

The following binary operators are valid, in order of priority (lowest priority first):

Operator	Description
<code> </code>	Boolean or
<code>&&</code>	Boolean and
<code> </code>	Bitwise or
<code>^</code>	Bitwise exclusive or
<code>&</code>	Bitwise and
<code>==</code>	Equality
<code>!=</code>	Inequality
<code><</code>	Less than
<code><=</code>	Less than or equal
<code>>=</code>	Greater than or equal

Operator	Description
>	Greater than
<<	Bitwise left shift
>>	Bitwise right shift
+	Addition
-	Subtraction
*	Multiplication
/	Division
%	Modulo

There are also the following unary operators, all of which bind tighter than any binary operator.

Operator	Description
-	Unary minus
+	Unary plus
!	Logical negation
~	Bitwise negation

An example filter would be $!(expression_1 \&\& expression_2)$.

API reference

This section is a reference guide to each of the MCU 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 MCU API calls. Click on the call to go to the page containing a complete description of the call.

The *Slave support* column indicates whether the call is supported on slave MCUs in clustered configurations. Refer to the online for more information on clustering.

API call	Page	Slave support
addressBookEntry.enumerate	22	N
auditlog.delete	26	Y
auditlog.query	27	Y
autoAttendant.destroy	27	N
autoAttendant.enumerate	27	N
autoAttendant.status	28	N
cdrlog.delete	28	N
cdrlog.enumerate	29	N
cdrlog.query	30	N
conference.create	30	N
conference.destroy	37	N
conference.end	37	N
conference.enumerate	38	N
conference.floor.modify	44	N
conference.floor.query	44	N
conference.modify	46	N

API call	Page	Slave support
conference.paneplacement.modify	50	N
conference.paneplacement.query	52	N
conference.resetCleanupTimeout	53	N
conference.status	53	N
conference.streaming.modify	53	N
conference.streaming.query	54	N
conferenceme.query	55	N
device.health.query	57	Y
device.network.query	57	Y
device.query	61	Y
device.restartlog.query	62	Y
gatekeeper.query	62	N
gateway.enumerate	64	N
participant.add	65	N
participant.connect	69	N
participant.diagnostics	69	N
participant.disconnect	73	N
participant.enumerate	74	N
participant.fecc	82	N
participant.message	83	N
participant.modify	83	N
participant.move	87	N
participant.remove	87	N
participant.status	87	N
services.query	89	N
sip.query	89	N
template.create	90	N
template.delete	91	N

API call	Page	Slave support
template.modify	90	N
template.status	96	N
template.enumerate	97	N

addressBookEntry.enumerate

Enumerates configured endpoints on the MCU.

Parameter	Type	Comments
Optional parameters		
enumerateID	String	The value returned by the last enumeration call. If it is omitted, a new enumeration is started.

This call returns the following:

Response	Type	Comments
addressBookEntries	Array	See below for details.
Optional parameters		
enumerateID	String	The value that should be used in the next call to get the next set of data. If this is omitted, no further data is available from the MCU.

The array “addressBookEntries” contains structures with the following fields:

Field	Type	Comments
Name	String	The configuration’s name.
address	String	The participant’s E.164 directory number, hostname or IP address.
protocol	String	One of h323, sip or vnc.
gatewayName	String	Present for H.323 endpoints which are configured to use a gateway. This name corresponds to the name of a gateway returned via gateway.enumerate.
gatewayAddress	String	Present for H.323 endpoints which are configured to use a gateway. This is the address of the gateway this endpoint is configured to use.
useSIPRegistrar	Boolean	Whether this endpoint is configured to use a SIP registrar when being called.
password	String	The password for VNC endpoints.

Field	Type	Comments
portNumber	Integer	The port number for VNC endpoints.
callInParams	Array	See below for details.
conferencingParameters	Array	See below for details.

The array `callInParams` contains structures with the following fields. This is used to match incoming participants to endpoint configurations. For a positive match a participant must match fields which have values. Blank fields are not considered in the comparison.

Field	Type	Comments
name	String	Endpoint name.
address	String	IP address.
e164	String	E.164 number.

The array `conferencingParameters` contains structures with the following fields:

Field	Type	Comments
useDefaultMotionSharpness	Boolean	If true, this endpoint will use box-wide default motion sharpness settings.
minFrameRateMotionSharpness	Integer	Only present if “useDefaultMotionSharpness” is false. Specifies the minimum frame rate for this endpoint.
useDefaultVideoTransmitResolutions	Boolean	If true , this endpoint will use box-wide default video transmit resolutions.
videoTransmitResolutions	String	One of: allowAll, 4to3Only, 4to3WidescreenOverride or 16to9Only.
maxMediaTxBitRate	Integer	Max media transmit bit rate.
maxMediaRxBitRate	Integer	Max media receive bit rate.
defaultLayout	String	Refer to Conference layouts later in this document for a list of layouts.
layoutControlDefault	Boolean	If true , this endpoint uses the layout control setting of the conference or template.
layoutControlEnabled	Boolean	Only present if <code>layoutControlDefault</code> is false . Indicates whether the participant has control over the layout. This is false if <code>layoutControlEx</code> is disabled, but

Field	Type	Comments
		true for any other value of layoutControlEx.
layoutControlEx	String	<p>Controls whether and how view layout can be controlled. One of:</p> <ul style="list-style-type: none"> ▶ disabled: Layout control is disabled. ▶ feccOnly: Layout can only be controlled via FECC. ▶ dtmfOnly: Layout can only be controlled via DTMF. ▶ feccAndDtmf: Layout can be controlled via FECC or DTMF if FECC is unavailable. ▶ feccWithDtmfFallback for using FECC when it is available and DTMF for endpoints which don't have FECC ▶ bothFeccAndDtmf to enable both FECC and DTMF controls
cameraControlDefault	Boolean	<ul style="list-style-type: none"> ▶ true if the endpoint uses the default camera control setting that is set by the conference or template. This case corresponds to the endpoint's interface option Send camera control to other participants being set to <i><use conference configuration></i>. ▶ false if the endpoint explicitly sends another type of camera control to participants.

Field	Type	Comments
cameraControl	String	<p>This field is not returned if the endpoint uses the conference-wide setting, that is, if <code>cameraControlDefault</code> is <code>true</code>. Returns one of the following if <code>cameraControlDefault</code> is <code>false</code>:</p> <ul style="list-style-type: none"> ▶ <code>disabled</code>: Camera control is disabled. ▶ <code>feccOnly</code>: Camera can only be controlled via FECC. ▶ <code>dtmfOnly</code>: Camera can only be controlled via DTMF. ▶ <code>feccAndDtmf</code>: Camera can be controlled via FECC, or by DTMF if FECC is unavailable. ▶ <code>feccWithDtmfFallback</code>: User can control camera with FECC when it is available and with DTMF if the endpoint doesn't support FECC. ▶ <code>bothFeccAndDtmf</code>: User can control camera with FECC or DTMF controls.
h239ContributionDefault	Boolean	If true, this endpoint will use box-wide H.239 contribution settings.
h239ContributionEnabled	Boolean	Only present if "h239ContributionDefault" is false. Specifies whether the endpoint will be able contribute H.239.
h239Negotiation	String	<p>When exchanging content with an endpoint in a H.323 call, the MCU acts as a master unit and the endpoint as a slave unit for the purpose of H.239 token negotiation. However, in order for the MCU to exchange content with a cascaded third party MCU, the MCU must appear to the third party MCU to be a slave unit.</p> <p>The MCU can be configured as a true slave, in which case content will only be sent if the third party MCU master accepts the token request, or as a mimic slave where content is sent to all other connected endpoints even if the third party MCU rejects the token request.</p> <p>The string can be one of three values:</p> <ul style="list-style-type: none"> ▶ <i>As master</i>: The MCU only acts as master in H.239 token negotiation. ▶ <i>As slave</i>: The MCU acts as the slave in H.239 token negotiation and can send content to a master unit if it accepts the token request. ▶ <i>Mimic slave</i>: The MCU acts as a mimic slave in H.239 token negotiation and

Field	Type	Comments
		will try to send content to all other endpoints/units even if this unit (i.e. the MCU configured as a mimic slave) rejects the token request.
initialAudioMuted	Boolean	Whether this participant would initially have their audio muted.
initialVideoMuted	Boolean	Whether this participant would initially have their video muted.
autoDisconnect	Boolean	When a participant disconnects from a conference and only participants who have autoDisconnect set to true remain, all those participants are disconnected.
borderWidth	Integer	0 (no border), or 1, 2, or 3 for +1/+2/+3.
addAsGuest	Boolean	Whether or not this participant is added as a guest when the MCU calls out to it. Set <code>true</code> if the participant is to be a guest, set <code>false</code> if the participant is to be a chair.
actAsRecorder	Boolean	Whether or not this participant will appear as a recorder. Set <code>true</code> if the participant should appear to other participants as a recorder.

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 <code>auditlog.query</code> call in <code>deleteableIndex</code> . 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 <code>deleteableIndex</code> . 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

This call queries the audit log. It 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.

autoAttendant.destroy

This call destroys auto attendants.

Parameter	Type	Comments
autoAttendantUniqueID	String	Identifier for the auto attendant to be destroyed.

autoAttendant.enumerate

Parameter	Type	Comments
Optional parameters		
enumerateID	String	The value returned by the last enumeration call, if omitted, a new enumeration is started.

The call has no valid enumerate filter expressions.

This call returns:

Response	Type	Comments
autoAttendants	Array	See below for details.
Optional responses		
enumerateID	String	The value which should be used in the next call to get the next set of data. If this is omitted, then no further data is available from the MCU.

The array “autoAttendants” contains structures with the following fields:

Response	Type	Comments
autoAttendantUniqueID	String	A unique identifier for the auto attendant
autoAttendantConfiguredName	String	If this participant is connected to an auto attendant, this field holds the name of that auto attendant: the value will change as the user navigates through an MCU's configured menu structure.
startTime	dateTime.iso8601	The time at which the auto attendant was created.

autoAttendant.status

This call returns a struct as described in [autoAttendant.enumerate](#) above, containing information about the auto attendant indicated.

A fault code of “no such conference” is returned if there is no auto attendant with the given identifier.

Parameter	Type	Comments
autoAttendantUniqueID	String	Identifier for the auto attendant from which information is required.

cdrlog.delete

Deletes stored events from the CDR log.

Parameter	Type	Comments
deleteIndex	Integer	You can delete logs in chunks of 400. To delete logs, you can enter the value returned by deleteableIndex. This will delete all complete chunks (400 logs) below this amount, leaving the residuals. Alternatively, you can delete less than this amount by picking a number below the value of deleteableIndex. This will delete all complete chunks (400 logs) below that number, leaving any residuals.

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

cdrlog.enumerate

This call allows the calling application to download CDR log data without having to return the entire CDR log. The call returns a subset of the CDR log based on the optional filter, index and numEvents parameters:

Parameter	Type	Comments
filter	Array	Optional. List of event types you are interested in. If omitted, all event types are returned. For the MCU, the call can request any / all of the following event types: <ul style="list-style-type: none"> ▶ scheduledConferenceStarted ▶ ad-hocConferenceStarted ▶ conferenceFinished ▶ participantJoined ▶ participantLeft
index	Integer	Optional. Index from which to get events. The device returns the <code>nextIndex</code> so the application can use it to retrieve the next enumeration of CDR data. If <code>index</code> is omitted or negative, the device will enumerate events from the beginning of the CDR log.
numEvents	Integer	Optional. Specifies maximum number of events to be returned per enumeration. If omitted (or not between 1 - 20 inclusive), a maximum of 20 events will be returned per enumeration.

The response provides reference information such as time and log position, and an array of events that meet the call parameters requested:

Parameter	Type	Comments
startIndex	Integer	Either the revision number provided, or if that is lower than the first record the device has, it will be the first record it does know about. Comparing this with the index provided gives the user the number of dropped logs.
nextIndex	Integer	Revision number of the data being provided, reusable in a subsequent call to the API.
eventsRemaining	Boolean	Whether there is data remaining after this. Provided to avoid putting all data in a single call.

Parameter	Type	Comments
events	Array	List of the new events; these are structures with some common fields (time, type, index) and other fields specific to the event type.
currentTime	dateTime.iso8601	Current time according to the device. This can help when calculating the client's local time for an event.

cdrlog.query

This call queries for statistics about the CDR log.

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.

conference.create

This call creates a new conference on the MCU. Conferences created through the management API will appear in the list of conferences accessible via the web interface, and vice versa.

This call returns an error if both `maximumVideoPorts` and `maximumAudioPorts` are set to 0 or if the total number of ports exceeds the maximum conference size (currently 80). The maximum conference size check is also performed for reserved ports.

Parameter	Type	Comments
conferenceName	String (<32 chars)	Name of the conference to be created. The conference name must be unique.
private	Boolean	Determines the visibility of this conference. This parameter corresponds to the "Visibility" setting on the web UI, which can have the value Public or Private.
joinAudioMuted	Boolean	Audio mute on join.
joinVideoMuted	Boolean	Video mute on join.
enforceMaximumAudioPorts	Boolean	Assumed to be true if absent. These can be set to false in order to specify no limit on the number of audio/video ports.
enforceMaximumVideoPorts	Boolean	

Parameter	Type	Comments
Optional parameters		
templateName templateNumber	String Integer	Pass one of these template reference parameters in <code>conference.create</code> to use the chosen template for the new conference. If no template reference is given, <code>conference.create</code> will use the default template.
numericId	String (<32 chars)	Numeric identifier of the conference.
guestNumericId	String	
registerWithGatekeeper	Boolean	Registers the conference's "numericId" with the gatekeeper.
registerWithSIPRegistrar	Boolean	Registers this conference with the SIP registrar.
startTime	dateTime.iso8601	If you do not specify a time, the conference starts immediately.
durationSeconds	Integer	The length of each repeating conference instance, in seconds. If this parameter is absent, or set to "0", the conference is permanent.
pin	String (< 32 chars)	If present, this is the string of numeric digits that people need to enter to join the conference.
guestPin	String	Security PIN for a guest.
description	String (< 32 chars)	
startLocked	Boolean	Defines whether or not the conference should be locked when it starts. Set <code>true</code> if you want it to start in the locked state.
conferenceMeEnabled	Boolean	Whether or not ConferenceMe is enabled for this conference.

Parameter	Type	Comments
automaticLectureMode	String	<p>This parameter deprecates <code>automaticLectureModeEnabled</code>. If you provide both, only <code>automaticLectureMode</code> is used.</p> <p>Type1: the MCU automatically applies lecture mode, if the lecture mode conditions are met, after the period (in seconds) given by <code>automaticLectureModeTimeout</code>. You must provide a value for the timeout integer.</p> <p>Type2: the MCU immediately applies lecture mode when the lecture mode conditions are met. You do not need to provide the <code>automaticLectureModeTimeout</code> parameter – it is always 0 for this automatic lecture mode..</p> <p>disabled: the MCU never applies lecture mode. You do not need to provide the <code>automaticLectureModeTimeout</code> parameter – the MCU ignores it.</p>
automaticLectureModeEnabled	Boolean	<p>Deprecated by <code>automaticLectureMode</code>.</p> <p>true: automatic lecture mode is enabled. The MCU will set <code>automaticLectureMode</code> to <code>type1</code> if you set this parameter to <code>true</code> and don't supply <code>automaticLectureMode</code>. You must supply an <code>automaticLectureModeTimeout</code>.</p> <p>false: automatic lecture mode is disabled. This corresponds to the <code>automaticLectureMode</code> parameter being set to disabled.</p>
automaticLectureModeTimeout	Integer	Length of time in seconds that a speaker must be talking for them to appear in full screen mode. The parameter has a range of 0 to 60 seconds. A setting of 0 seconds will cause a new speaker to appear in full screen immediately.
multicastStreamingEnabled	Boolean	
unicastStreamingEnabled	Boolean	
contentMode	String	<p>One of:</p> <p>disabled: no content in this conference</p> <p>transcoded: incoming content is always decoded and then re-encoded.</p>

Parameter	Type	Comments
h239Enabled	Boolean	Deprecated in favor of <code>contentMode</code> . If you set the deprecated <code>h239Enabled</code> parameter to <code>true</code> , <code>contentMode</code> will be set to <code>transcoded</code> . If you set <code>h239Enabled</code> to <code>false</code> , <code>contentMode</code> will be set to <code>disabled</code> .
lastChairmanLeavesDisconnect	Boolean	Corresponds to the “When only guests remain” conference setting in the web UI. Set <code>true</code> to disconnect all participants after the last chairman leaves the conference, or set <code>false</code> to take no action.
cleanupTimeout	Integer	<p>Allows the MCU to automatically delete the conference when it is empty.</p> <p>Set the parameter to a number of seconds. The MCU will delete the conference if it has been empty for the specified number of seconds.</p> <p>Use 0 to disable automatic deletion.</p> <p>If the conference has an end time, the timeout will only start after the end time, even if it is empty before that time.</p> <p>Permanent conferences will be deleted when they become empty and remain empty for the timeout (‘empty’ excludes recorders, streamers and slave to master links).</p> <p>Scheduled conferences won’t be deleted before they’re scheduled to start.</p>
preconfiguredParticipantsDefer	Boolean	Corresponds to the “Invite pre-configured participants” conference setting in the web UI. Set <code>true</code> to invite preconfigured participants when at least one other participant is present, or set <code>false</code> to invite them at the start of the conference.
contentTxCodec	String	<p>The transcoder output format. One of:</p> <p><code>h263+</code> <code>h264</code></p> <p>This setting does not apply in passthrough mode.</p>
contentTxMinimumBitRate	String	<p>The minimum bit rate to use for transmitting content, in bps. One of:</p> <p><code>0,64000,128000,192000,256000,320000,384000,512000,768000,1000000,1250000,1500000</code></p>
maximumAudioPorts	Integer	These fields set the limit on the number of audio (audio only) and video (video + audio) ports for the conference. The
maximumVideoPorts	Integer	

Parameter	Type	Comments
reservedAudioPorts	Integer	“reserved” values are for port reservation mode, whereas the “maximum” figures apply to non-reserved mode (and will be absent if no limits have been configured).
reservedVideoPorts	Integer	If the value of the reservedAudioPorts parameter exceeds the total number of available audio ports, the MCU will reserve all available audio ports and reserve the remainder as video ports. For example, if the MCU has 20 video and 20 audio only ports and a request is made to reserve 30 audio only ports, the MCU will reserve 20 audio only ports and 10 video ports.
repetition	String	One of: none , daily , weekly , everyTwoWeeks or monthly .
weekDay	String	Must be present if repetition is monthly . One of monday , tuesday , wednesday , thursday , friday , saturday or sunday . Note that if repetition is not weekly or everyTwoWeeks , the “weekDays” parameter should be used.
whichWeek	String	Must be present if repetition is monthly . One of: first (the first X of the month, where X is the day specified by weekday), second , third , fourth , or last (i.e. last X of the month).
weekDays	String	Must be present if repetition is weekly or everyTwoWeeks . A comma separated string of weekdays (i.e. any of monday , tuesday , wednesday , thursday , friday , saturday or sunday), e.g. monday , wednesday , friday .
terminationType	String	One of: noTermination afterNRepeats endOnGivenDate .
terminationDate	dateTime.iso8601	If terminationType is endOnGivenDate , this is the day that the conference repetition will end on.
numberOfRepeats	Integer	If terminationType is afterNRepeats , this is the number of repeats to end after.
customLayoutEnabled	Boolean	true if the layout is enabled, false otherwise.

Parameter	Type	Comments
layoutControlEx	String	<p>Controls whether and how view layout can be controlled. One of:</p> <ul style="list-style-type: none"> ▶ <code>disabled</code>: Layout control is disabled. ▶ <code>feccOnly</code>: Layout can only be controlled via FECC. ▶ <code>dtmfOnly</code>: Layout can only be controlled via DTMF. ▶ <code>feccAndDtmf</code>: Layout can be controlled via FECC or DTMF if FECC is unavailable. ▶ <code>feccWithDtmfFallback</code> for using FECC when it is available and DTMF for endpoints which don't have FECC ▶ <code>bothFeccAndDtmf</code> to enable both FECC and DTMF controls
cameraControl	String	<p>Defines how the endpoint cameras can be controlled. Corresponds to the Send camera control to participants setting in the web interface:</p> <ul style="list-style-type: none"> ▶ <code>disabled</code>: Camera control is disabled. ▶ <code>feccOnly</code>: Camera can only be controlled via FECC. ▶ <code>dtmfOnly</code>: Camera can only be controlled via DTMF. ▶ <code>feccAndDtmf</code>: Camera can be controlled via FECC, or by DTMF if FECC is unavailable. ▶ <code>feccWithDtmfFallback</code>: User can control camera with FECC when it is available and with DTMF if the endpoint doesn't support FECC. ▶ <code>bothFeccAndDtmf</code> to enable both FECC and DTMF controls.
newParticipantsCustomLayout	Boolean	true if new participants use the custom layout, false otherwise. Only valid if <code>customLayoutEnabled</code> is true.
customLayout	Integer	The video layout seen by the participant. Refer to <i>Conference layouts</i> on page 109 for the full list of available layouts.

Parameter	Type	Comments
chairControl	String	The chair control setting for the conference. This can be none , floorControlOnly or chairAndFloorControl - these values correspond to the web interface "Floor and chair control" setting values of "Do not allow floor or chair control", "Allow floor control only" and "Allow floor and chair control" respectively. If not specified, the chair control setting for the new conference will be "Allow floor control only".
suppressDtmfEx	String	Controls the muting of DTMF tones. One of: fecc : DTMF tones are muted when DTMF is being used to control layout but far end camera control (FECC) is not available. always : DTMF tones are always muted never : DTMF tones are never muted
dtmfMuteControl	Boolean	Controls whether the user can mute audio using *6. Either: true : participant can mute audio using *6 false : participant cannot mute audio using *6.
automaticLectureModeEnabled	Boolean	Automatic lecture mode shows the speaker full screen. Either: true : automatic lecture mode enabled. false : automatic lecture mode disabled. If automatic lecture mode is enabled, the automaticLectureModeTimeout parameter is required.
automaticLectureModeTimeout	Integer	Length of time in seconds that a speaker must be talking for them to appear in full screen mode. The parameter has a range of 0 to 60 seconds. A setting of 0 seconds will cause a new speaker to appear in full screen immediately.
encryptionRequired	Boolean	The encryption setting for this conference, if you have the encryption feature key enabled. Either: true : Encryption is required for this conference. false : Encryption is optional for this conference.

Parameter	Type	Comments
contentContribution	Boolean	Whether, by default, endpoints are permitted to contribute the content channel for a conference through the mechanism of opening a content video channel. Either: <code>true</code> : Content contribution is enabled. <code>false</code> : Content contribution is disabled.
contentTransmitResolutions	String	The resolution for the content channel that will be transmitted to endpoints in this conference. One of: <code>4to3Only</code> : The MCU will encode the content and transmit it in a resolution of ratio 4:3 only. <code>16to9Only</code> : the MCU will encode the content and transmit it in a resolution of ratio 16:9 only. <code>allowAll</code> : the MCU will decide on the most optimal resolution depending on information about capabilities sent by the endpoints in the conference.

Deprecated parameters

Parameter	Type	Comments
conferenceID	String (< 32 chars)	Deprecated alternative for numericId.
endTime	DateTime.iso8601	If you do not specify an end time, then the conference will be permanent (until it is explicitly deleted). Application code should use “durationSeconds” instead.
layoutControlEnabled	Boolean	Layout control via FECC/DTMF. Deprecated by layoutControlEx.

conference.destroy

This call destroys a conference on the MCU. It is removed from the list of conferences. (Compare with `conference.end` below.) A conference can be destroyed at any time; that is, before the conference has begun, during the conference or after the conference has ended. Destroyed conferences are removed entirely from the system; this includes all future repetitions of the conference.

Parameter	Type	Comments
conferenceName	String	Name of the conference to be destroyed.

conference.end

This call ends a conference on the MCU. A conference remains in the list of conferences even after the conference has ended — until `conference.destroy` (above) is called. In particular, this can be used to end an instance of a conference without deleting all future repetitions.

Parameter	Type	Comments
conferenceName	String	Name of the conference to be ended.

conference.enumerate

Returns some or all conferences scheduled, running or completed on the MCU.

This call returns an error if both `maximumVideoPorts` and `maximumAudioPorts` are set to 0 or if the total number of ports exceeds the maximum conference size (currently 80). The maximum conference size check is also performed for reserved ports.

Parameter	Type	Comments
enumerateID (optional)	String	The value returned by the last enumeration call. If it is omitted, a new enumeration is started.
enumerateFilter	String	A filter expression.
moreThanFour (optional)	Boolean	Enables the call to return more than four conferences (up to 24).

Valid expressions within the enumerate filter are as follows:

Expression	Type	Comments
active	Boolean	True if the conference is active.
completed	Boolean	True if the conference has finished.
scheduled	Boolean	True if the conference is a scheduled conference (regardless of if it has been completed or not).

This call returns:

Response	Type	Comments
enumerateID (optional)	String	The value which should be used in the next call to get the next set of data. If this is omitted, no further data is available from the MCU.
conferences	Array	See below for details.
joinAudioMuted	Boolean	Audio mute on join.
joinVideoMuted	Boolean	Video mute on join.
layoutControlEnabled	Boolean	Layout control via FECC/DTMF.

conferences array

The array “conferences” contains structures with the following fields:

Field	Type	Comments
conferenceName	String	
conferenceType	String	One of: <code>scheduled</code> or <code>ad_hoc</code> .
uniqueId	Integer	An ID unique among all scheduled and ad hoc conferences, each instantiation of a scheduled conference will have the same uniqueId.
conferenceActive	Boolean	Indicates whether conference is currently active.
description	String	Extra user-specified information about the conference
pin	String	The security PIN.
guestPin	String	Security PIN for a guest.
numericId	String	
guestNumericId	String	
registerWithGatekeeper	Boolean	
registerWithSIPRegistrar	Boolean	Registers this conference with the SIP registrar.
multicastStreamingEnabled	Boolean	
unicastStreamingEnabled	Boolean	
conferenceMeEnabled	Boolean	Whether or not ConferenceMe is enabled for this conference.
contentMode	String	One of: <code>disabled</code> : no content in this conference <code>transcoded</code> : incoming content is always decoded and then re-encoded.
h239Enabled	Boolean	Deprecated in favor of <code>contentMode</code> . If you set the deprecated <code>h239Enabled</code> parameter to <code>true</code> , <code>contentMode</code> will be set to <code>transcoded</code> . If you set <code>h239Enabled</code> to <code>false</code> , <code>contentMode</code> will be set to <code>disabled</code> .

Field	Type	Comments
contentImportant	Boolean	Whether or not content is set to be important.
h239Important	Boolean	Whether the H.239 channel is set to be important. Consider this setting deprecated in favor of <code>contentImportant</code> . The setting will still work however, even if the content channel is SIP or VNC or content from a main video participant.
contentTxCodec	String	The transcoder output format. One of: <code>h263+</code> <code>h264</code> This setting does not apply in passthrough mode.
contentTxMinimumBitRate	String	The minimum bit rate to use for transmitting content, in bps. One of: <code>0,64000,128000,192000,256000,320000,384000,512000,768000,1000000,1250000,1500000</code>
lastChairmanLeavesDisconnect	Boolean	Corresponds to the “When only guests remain” conference setting in the web UI. If <code>true</code> the conference will disconnect all participants after the last chairman leaves the conference. If <code>false</code> the MCU takes no action.
preconfiguredParticipantsDefer	Boolean	Corresponds to the “Invite pre-configured participants” conference setting in the web UI. If <code>true</code> the MCU will invite preconfigured participants when at least one other participant is present. If <code>false</code> it will invite preconfigured participants at the start of the conference.
locked	Boolean	Whether the conference is locked or unlocked.
maximumAudioPorts	Integer	These fields set the limit on the number of audio (audio only) and video (video + audio) ports for the conference. The “reserved” values are for port reservation mode, whereas the “maximum” figures apply to non-reserved mode (and will be
maximumVideoPorts	Integer	
reservedAudioPorts	Integer	

Field	Type	Comments
reservedVideoPorts	Integer	absent if no limits have been configured). If the value of the reservedAudioPorts parameter exceeds the total number of available audio ports, the MCU will reserve all available audio ports and reserve the remainder as video ports. For example, if the MCU has 20 video and 20 audio only ports and a request is made to reserve 30 audio only ports, the MCU will reserve 20 audio only ports and 10 video ports.
customLayoutEnabled	Boolean	True if a custom layout has been enabled for this conference.
customLayout (optional)	Integer	The index of the custom layout. This is only present if the custom layout is enabled. See <i>Conference layouts</i> on page 109 for a list of index values.
newParticipantsCustomLayout	Boolean	True if new participants will use the conference custom layout.
private	Boolean	True if this conference is a private conference.
chairControl	String	The chair control setting for this conference. See the chairControl description in conference.create for an explanation of the values this parameter can take.
suppressDtmfEx	String	Controls the muting of DTMF tones. One of: fecc : DTMF tones are muted when DTMF is being used to control layout but far end camera control (FECC) is not available always : DTMF tones are always muted never : DTMF tones are never muted
layoutControlEx	String	Indicates whether and how view layout can be controlled. One of: <ul style="list-style-type: none"> ▶ disabled: Layout control is disabled. ▶ feccOnly: Layout can be controlled via FECC. ▶ dtmfOnly: Layout can only be controlled via DTMF. ▶ feccAndDtmf: Layout can be controlled via FECC or DTMF if FECC is unavailable. ▶ feccWithDtmfFallback for using FECC when it is available and DTMF

Field	Type	Comments
		<p>for endpoints which don't have FECC</p> <ul style="list-style-type: none"> ▶ <code>bothFeccAndDtmf</code> to enable both FECC and DTMF controls
<code>cameraControl</code>	String	Indicates how the camera can be controlled. Returns the same values as <code>layoutControlEx</code> .
<code>dtmfMuteControl</code>	Boolean	<p>Controls whether the user can mute audio using *6. Either:</p> <p><code>true</code>: participant can mute audio using *6</p> <p><code>false</code>: participant cannot mute audio using *6.</p>
<code>automaticLectureMode</code>	String	<p>Automatic lecture mode shows the speaker full screen. This parameter deprecates <code>automaticLectureModeEnabled</code>.</p> <p>Type1: the MCU automatically applies lecture mode after the period (in seconds) given by <code>automaticLectureModeTimeout</code>. The timeout integer is present in the response.</p> <p>Type2: the MCU automatically applies lecture mode immediately. The <code>automaticLectureModeTimeout</code> parameter is in the response but is always 0 for this type of automatic lecture mode.</p> <p>disabled: the MCU never applies lecture mode. There is no timeout parameter in the response.</p>
<code>automaticLectureModeEnabled</code>	Boolean	<p>Deprecated by <code>automaticLectureMode</code>.</p> <p><code>true</code>: automatic lecture mode is enabled. <code>automaticLectureMode</code> may be either type 1 or type 2 if this parameter is <code>true</code>.</p> <p><code>false</code>: automatic lecture mode is disabled. This corresponds to the <code>automaticLectureMode</code> parameter being set to disabled.</p> <p>If <code>automaticLectureModeEnabled</code> is <code>true</code>, then the <code>automaticLectureModeTimeout</code> parameter is also returned.</p>
<code>automaticLectureModeTimeout</code>	Integer	Length of time in seconds that a speaker must be talking for them to appear in full screen mode. The parameter has a range

Field	Type	Comments
		of 0 to 60 seconds. A setting of 0 seconds will cause a new speaker to appear in full screen immediately.
encryptionRequired	Boolean	The encryption setting for this conference, if you have the encryption feature key enabled. Either: <code>true</code> : Encryption is required for this conference. <code>false</code> : Encryption is optional for this conference.
contentContribution	Boolean	Whether, by default, endpoints are permitted to contribute the content channel for a conference through the mechanism of opening a content video channel. Either: <code>true</code> : Content contribution is enabled. <code>false</code> : Content contribution is disabled.
The following timing fields will be present for scheduled conferences only		
startTime	dateTime.iso8601	The time at which the conference started at or will start at.
durationSeconds	Integer	How long each repeating instance of the conference should last for. If absent, the conference is permanent.
repetition(optional)	String	One of <code>none</code> , <code>daily</code> , <code>weekly</code> , <code>everyTwoWeeks</code> or <code>monthly</code> .
weekDay(optional)	String	Present if repetition is <code>monthly</code> . One of <code>monday</code> , <code>tuesday</code> , <code>wednesday</code> , <code>thursday</code> , <code>friday</code> , <code>saturday</code> or <code>sunday</code> .
whichWeek (optional)	String	Present if repetition is <code>monthly</code> . One of: <code>first</code> (the first X of the month, where X is the day specified by weekday), <code>second</code> , <code>third</code> , <code>fourth</code> , or <code>last</code> (i.e. last X of the month).
weekDays (optional)	String	A comma separated string of weekdays (i.e. any of <code>monday</code> , <code>tuesday</code> , <code>wednesday</code> , <code>thursday</code> , <code>friday</code> , <code>saturday</code> or <code>sunday</code>), e.g. <code>monday,wednesday,friday</code> . This field is present when repetition is <code>weekly</code> or <code>everyTwoWeeks</code> .
terminationType(optional)	String	One of: <code>noTermination</code> , <code>afterNRepeats</code> or <code>endOnGivenDate</code> .

Field	Type	Comments
terminationDate(optional)	dateTime.iso8601	If terminationType is endOnGivenDay, this is the day that the conference repetition will end on.
The following timing values will be present for active conferences only		
activeStartTime	dateTime.iso8601	If the conference is currently active, these fields show the time span of the current activation. If the conference is permanent then "activeEndTime" will be absent.
activeEndTime	dateTime.iso8601	
activeConferenceId	string	A unique ID for the active instance of this conference; this conference will have this ID even if, for example, the conference is renamed while active, but each scheduled instance of this conference will have a different activeConferenceId.

conference.floor.modify

This call modifies the status of the conference floor control.

Response	Type	Comments
conferenceName	String	The name of the conference to affect.
floorStatus	String	'inactive' if no floor status is enabled, 'active' if an endpoint has floor control, or 'assign' if the chair or API had assigned floor control.
Optional parameters		
floorParticipant	Struct	If floorStatus is not 'inactive' then the participant identification structure will contain participantName, participantType, and participantProtocol.

conference.floor.query

This call queries the status of the conference floor control.

Response	Type	Comments
enabled	Boolean	Whether box wide and conference settings allow floor control to be assigned.
floorStatus	String	'inactive' if no floor status is enabled, 'active' if an endpoint has floor control, or assigned if the chair or API had assigned floor control.
Optional parameters		

floorParticipant	Struct	If floorStatus is not 'inactive' then the participant identification structure will contain participantName, participantType, and participantProtocol.
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conference.modify

This call modifies the settings of an existing conference. Conferences created through the management API will appear in the list of conferences accessible via the web interface. Therefore, the API can be used to modify conferences scheduled via the web interface, and vice versa.

This call returns an error if both `maximumVideoPorts` and `maximumAudioPorts` are set to 0 or if the total number of ports exceeds the maximum conference size (currently 80). The maximum conference size check is also performed for reserved ports.

Parameter	Type	Comments
conferenceName	String (< 32 chars)	Name of the conference to modify.
newConferenceName (optional)	String (< 32 chars)	If present, the conference will be renamed to specified value.
Optional parameters		
numericId	String (< 32 chars)	Fields as per conference.create described above. These fields can only be used for conferences which are not of type <code>ad_hoc</code> . <code>h239Enabled</code> is deprecated in favor of <code>contentMode</code> . If you set the deprecated <code>h239Enabled</code> parameter to <code>true</code> , <code>contentMode</code> will be set to <code>transcoded</code> . If you set <code>h239Enabled</code> to <code>false</code> , <code>contentMode</code> will be set to <code>disabled</code> .
guestNumericId	String	
pin	String	
guestPin	String	
registerWithGatekeeper	Boolean	
registerWithSIPRegistrar	Boolean	
startTime	dateTime.iso8601	
durationSeconds	Integer	
Description	String	
multicastStreamingEnabled	Boolean	
unicastStreamingEnabled	Boolean	
contentMode	String	
h239Enabled	Boolean	
contentTxCodec	String	
contentTxMinimumBitrate	String	
conferenceMeEnabled	Boolean	
preConfiguredParticipantsDefer	Boolean	

Parameter	Type	Comments
lastChairmanLeavesDisconnect	Boolean	
private	Boolean	
reservedVideoPorts	Integer	
reservedAudioPorts	Integer	
maximumVideoPorts	Integer	
maximumAudioPorts	Integer	
repetition	String	
weekDay	String	
whichWeek	String	
weekDays	String	
terminationType	String	
terminationDate	dateTime.iso8601	
numberOfRepeats	Integer	
contentImportant	Boolean	Sets the content channel to be important. Set <code>true</code> to make the content channel display prominently in the participants' layouts.
h239Important	Boolean	Whether the H.239 channel is set to be important. Consider this setting deprecated in favor of <code>contentImportant</code> .
locked	Boolean	Locks or unlocks the conference.
startLocked	Boolean	Defines whether or not the conference should be locked when it starts. Set <code>true</code> if you want it to start in the locked state.
customLayoutEnabled	Boolean	Fields, as for the conference.create call above.
layoutControlEx	String	
cameraControl	String	
newParticipantsCustomLayout	Boolean	
customLayout	Integer	

Parameter	Type	Comments
chairControl	String	
enforceMaximumAudioPorts	Boolean	Assumed to be true if absent. These can be set to false in order to specify no limit on the number of audio/video ports.
enforceMaximumVideoPorts	Boolean	
suppressDtmfEx	String	Controls the muting of DTMF tones. One of: fecc : DTMF tones are muted when DTMF is being used to control layout but far end camera control (FECC) is not available always : DTMF tones are always muted never : DTMF tones are never muted
dtmfMuteControl	Boolean	Controls whether the user can mute audio using *6. Either: true : participant can mute audio using *6 false : participant cannot mute audio using *6.
automaticLectureMode	String	This parameter deprecates <code>automaticLectureModeEnabled</code> . If you provide both, only <code>automaticLectureMode</code> is used. Type1 : the MCU automatically applies lecture mode, if the lecture mode conditions are met, after the period (in seconds) given by <code>automaticLectureModeTimeout</code> . You must provide a value for the timeout integer. Type2 : the MCU immediately applies lecture mode when the lecture mode conditions are met. You do not need to provide the <code>automaticLectureModeTimeout</code> parameter – it is always 0 for this automatic lecture mode.. disabled : the MCU never applies lecture mode. You do not need to provide the <code>automaticLectureModeTimeout</code> parameter – the MCU ignores it.

Parameter	Type	Comments
<code>automaticLectureModeEnabled</code>	Boolean	<p>Deprecated by <code>automaticLectureMode</code>.</p> <p><code>true</code>: enable automatic lecture mode. The MCU will set <code>automaticLectureMode</code> to <code>type1</code> if you don't provide <code>automaticLectureMode</code>. You must also supply an <code>automaticLectureModeTimeout</code>.</p> <p><code>false</code>: disable automatic lecture mode. The MCU will set <code>automaticLectureMode</code> to <code>disabled</code> if you don't provide <code>automaticLectureMode</code>.</p>
<code>automaticLectureModeTimeout</code>	Integer	<p>Length of time in seconds that a speaker must be talking for them to appear in full screen mode. The parameter has a range of 0 to 60 seconds. A setting of 0 seconds will cause a new speaker to appear in full screen immediately.</p> <p>The MCU only reads this value if you set either <code>automaticLectureModeEnabled</code> to <code>true</code> or <code>automaticLectureMode</code> to <code>type1</code>.</p>
<code>encryptionRequired</code>	Boolean	<p>The encryption setting for this conference, if you have the encryption feature key enabled. Either:</p> <p><code>true</code>: Encryption is required for this conference.</p> <p><code>false</code>: Encryption is optional for this conference.</p>
<code>contentContribution</code>	Boolean	<p>Whether, by default, endpoints are permitted to contribute the content channel for a conference through the mechanism of opening a content video channel. Either:</p> <p><code>true</code>: Content contribution is enabled.</p> <p><code>false</code>: Content contribution is disabled.</p>

Parameter	Type	Comments
contentTransmitResolutions	String	<p>The resolution for the content channel that will be transmitted to endpoints in this conference. One of:</p> <p>4to3Only: The MCU will encode the content and transmit it in a resolution of ratio 4:3 only.</p> <p>16to9Only: the MCU will encode the content and transmit it in a resolution of ratio 16:9 only.</p> <p>allowAll: the MCU will decide on the most optimal resolution depending on information about capabilities sent by the endpoints in the conference.</p>

Deprecated parameters

Parameter	Type	Comments
oldConferenceName	String (< 32 chars)	Deprecated conference renaming scheme – new code should use conferenceName and newConferenceName as above.
conferenceName	String (< 32 chars)	
conferenceID	String	The unique ID for the conference.
endTime	dateTime.iso8601	<p>If you do not specify an end time, then the conference will be permanent (until it is explicitly deleted).</p> <p>Application code should use “durationSeconds” instead.</p>
layoutControlEnabled	Boolean	Layout control via FECC/DTMF. Deprecated by layoutControlEx.

conference.paneplacement.modify

Modifies the pane placement configuration of a particular conference.

Parameter	Type	Comments
conferenceName	String	Name of the conference to be modified.
Optional parameters		
enabled	Boolean	true to enable pane placement, false to disable.
panes	Array	See below for details.

The panes array contains structures which define a specific pane and its contents. If a pane index is not present in the array, then that pane will remain unchanged. Participant identification is as returned in participant.enumerate.

Field	Type	Comments
index	Integer	The index of the pane to be changed.
type	String	Any one of: default - the default behaviour blank - a blank window loudest - the current loudest speaker rolling – shows a sequence of conference participants, changing according to the configured rolling interval h239 - the h239 content channel participant - a participant as described in the three optional fields.

Optional parameters		
participantType	String	Participant identification. Only required if type is participant, these identify a specific participant.
participantProtocol	String	
participantName	String	

Because not all panes are guaranteed to be changed, this call returns the following structure:

Response	Type	Comments
panesModified	Integer	The number of panes successfully modified. This will be the number of elements in the panes array on complete success, and zero if there is no panes array.

conference.paneplacement.query

Queries the current pane placement configuration.

Parameter	Type	Comments
conferenceName	String	The name of the conference to be queried.

This returns a struct containing the following response fields:

Response	Type	Comments
enabled	Boolean	true if pane placement is enabled and in use; false otherwise.

Optional parameters		
panes (optional)	Array	This is only present if enabled above is true. The struct definition is as below.

The panes array contains structures with the following format:

Field	Type	Comments
type	String	Any one of: default - the default behaviour blank - a blank window loudest - the current loudest speaker rolling – shows a sequence of conference participants, changing according to the configured rolling interval h239 - the h239 content channel participant - a participant as identified below.
index	Integer	The index of this pane.

Optional parameters		
participantType	String	Participant identification. Only present if this pane contains a specific participant.
participantProtocol	String	
participantName	String	

conference.resetCleanupTimeout

Field	Type	Comments
conferenceName	String	Resets the cleanup timeout on the named conference.

conference.status

Returns information about a named conference on the MCU.

This call returns an error if both `maximumVideoPorts` and `maximumAudioPorts` are set to 0 or if the total number of ports exceeds the maximum conference size (currently 80). The maximum conference size check is also performed for reserved ports.

Parameter	Type	Comments
conferenceName	String	Name of the conference for which information is required.

This call returns a struct as described in [conference.enumerate](#) above, containing information about the conference indicated.

A fault code of “no such conference” is returned if there is no conference with the given name.

conference.streaming.modify

Modifies the current layout for streaming viewers for a conference.

Parameter	Type	Comments
conferenceName	String	Name of the conference whose layout is to be modified.
Optional parameters		
cpLayout	String	The video layout seen by the participant. Refer to <i>Conference layouts</i> on page 109 for the full list of available layouts..
borderWidth	Integer	0 (no border), or 1, 2, or 3 for +1/+2/+3.
focusType	String	One of: voiceActivated, h239 or participant.

focusParticipant	Struct	A participant identification structure (i.e. with conferenceName, participantName, participantProtocol and participantType members). Should only be present if focusType is participant.
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conference.streaming.query

Returns details on the current state of streaming viewers for a conference.

Parameter	Type	Comments
conferenceName	String	Name of the conference from which streaming information is required.

This will return a structure with the following fields:

Response	Type	Comments
unicastViewers	Integer	The number of unicast streaming viewers.
multicastViewers	Integer	The number of multicast streaming viewers.
audioRTCPReceiverReports	Integer	The number of RTCP receiver reports for the audio streams seen by the MCU.
audioRTCPSenderReports	Integer	The number of RTCP sender reports for the audio streams seen by the MCU.
audioRTCPOther	Integer	The number of other RTCP packets seen for the audio streams.
audioRTCPPacketsSent	Integer	The number of RTCP packets sent by the MCU.
videoRTCPReceiverReports	Integer	As for the audio equivalents.
videoRTCPSenderReports	Integer	
videoRTCPOther	Integer	
videoRTCPPacketsSent	Integer	
currentLayout	Integer	The actual layout in use for the video stream being sent by the MCU to streaming viewers. Refer to <i>Conference layouts</i> on page 109 for the full list of available layouts.
layoutSource	String	One of family<x>, conferenceCustom, or participantCustom, and describes the reason for the current layout.

Response	Type	Comments
focusType	String	One of: <code>participant</code> , <code>voiceActivated</code> or <code>h239</code> .
focusParticipant	Struct	A participant identification structure (i.e. with <code>conferenceName</code> , <code>participantName</code> , <code>participantProtocol</code> and <code>participantType</code> members). Should only be present if <code>focusType</code> is <code>participant</code> .
borderWidth	Integer	0 (no border), or 1, 2, or 3 for +1/+2/+3.
Optional parameters		
audioStreams (optional)	Array	An array of stream structs (defined below). These are only present if there are any streams of either type currently in use.
videoStreams (optional)	Array	

The stream structures used in the `audioStreams`/`videoStreams` responses above have the following fields:

Field	Type	Comments
codec	String	The codec in use, or <code>other</code> for undefined codecs.
count	Integer	The number of users of this codec.
Optional parameters		
bitRate	Integer	The bit rate of this stream in bits/second. This is only present for video streams with a defined codec.
width	Integer	The maximum width and height of this stream. Only present for defined video streams
height	Integer	

This call will return a fault code of "no such conference" if there is no *active* conference with the given name, regardless of the presence a configured but inactive conference of that name.

conferenceme.query

Queries for information about ConferenceMe.

Response	Type	Comments
enabled	Boolean	True if ConferenceMe is enabled and in use; false otherwise. (If no feature key is installed this will be false).

maxBitRateFromMCU	Number	Maximum bandwidth from the MCU. (If no feature key is installed this will be 0).
maxBitRateToMCU	Number	Maximum bandwidth to the MCU. (If no feature key is installed this will be 0).
mediaOverTcp	Boolean	Allow fall-back to media via TCP. (If no feature key is installed this will be false).
useWebService	Boolean	<code>true</code> if ConferenceMe may use web service to connect clients to a conference. Corresponds to the Allow ConferenceMe to use web service checkbox on the web interface.

device.health.query

Returns the current status of the MCU, 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	
fanStatus	String	One of ok, outOfSpec or critical.
fanStatusWorst	String	
temperatureStatus	String	
temperatureStatusWorst	String	
rtcBatteryStatus	String	
rtcBatteryStatusWorst	String	
voltagesStatus	String	
voltagesStatusWorst	String	
operationalStatus	String	One of active, shuttingDown or shutDown.

device.network.query

This call queries the MCU for information about port configuration. The call takes no parameters and returns the following three data structures. These are detailed in the tables that follow.

Parameter	Type	Comments
portA	Struct (see following table)	Contains the configuration and status for port A.
portB	Struct (see following table)	Contains the configuration and status for port B.
dns	Array(see dns array table)	

port data structures

For each port on the device, `device.network.query` returns the following data:

Field	Type	Comments
enabled	Boolean	true if the port is enabled, otherwise false.
ipv4Enabled	Boolean	true if IPv4 interface is enabled. Always returned unless there are no IP interfaces enabled on the port (neither IPv4 nor IPv6 is enabled).
ipv6Enabled	Boolean	true if IPv6 interface is enabled. Always returned unless there are no IP interfaces enabled on the port (neither IPv4 nor IPv6 is enabled).
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	
bytesSent64	String	64 bit versions of the above stats, using a string rather than an integer.
bytesReceived64	String	
Optional parameters		

Field	Type	Comments
hostName	String	The host name of the system, deprecated.
dhcp	Boolean	<code>true</code> if ipv4 address configured by DHCP, otherwise <code>false</code> .
ipAddress	String	IPv4 address in the dotted quad format.
subnetMask	String	IPv4 netmask in the dotted quad format.
defaultGateway	String	IPv4 address in the dotted quad format.
domainName	String	The domain name of the system. Deprecated.
nameServer	String	a.b.c.d format. Deprecated.
nameServerSecondary	String	a.b.c.d format. Deprecated.
ipv6Address	String	IPv6 address, X:X:X::X format.
ipv6Conf	String	One of <code>automatic</code> (IPv6 address configured by SLAAC/DHCPv6) or <code>manual</code> (IPv6 address specified manually).
ipv6PrefixLength	Integer	IPv6 address prefix length
defaultIpv6Gateway	String	Ipv6 default gateway, X:X:X::X%X format
linkLocalIpv6Address	String	Linklocal Ipv6 address, X:X:X::X%X format
linkLocalIpv6PrefixLength	Integer	Linklocal Ipv6 address prefix length

Optional fields will only be returned if the interface is enabled and the options have been configured. Addresses that are not configured will return either an empty string or a dash ‘-’.

dns array

The device returns the following DNS status:

Parameter	Type	Comments
hostName	String	The host name of the system.
nameServer	String	a.b.c.d or X:X:X::X format.
nameServerSecondary	String	a.b.c.d or X:X:X::X format.
domainName	String	The domain name of the system (DNS suffix).

device.query

Queries for information about the MCU device. There are no parameters passed with this call. The call 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 MCU.
softwareVersion	String	The software version of the running software.
buildVersion	String	The build version of the running software.
model	String	The model of this MCU, e.g. "..... MCU 4210".
apiVersion	String	The version number of the API implemented by this MCU.
activatedFeatures	Array	Currently, only contains the string "feature" with a short description of the feature.
totalVideoPorts	Integer	The total number of video ports on the MCU.
totalAudioOnlyPorts	Integer	The total number of additional audio-only ports on the MCU.
totalStreamingAndContentPorts	Integer	The total number of streaming and content ports on the MCU. Only provided if non-zero.
portReservationMode	String	enabled or disabled, depending on the Media Port Reservation configuration setting. Only present on MCU products.
maxVideoResolution	String	One of <code>cif</code> or <code>4cif</code> .
videoPortAllocation	Array	Array of <code>structs</code> containing a <code>type</code> element and a <code>count</code> element. The <code>type</code> element can be one of <code>sd</code> , <code>hd</code> , <code>hdPlus</code> , or <code>fullhd</code> . <code>count</code> is an integer indicating the number of video ports allocated.

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	<p>The reason for the reboot. May be one of the following:</p> <ul style="list-style-type: none"> ▶ User requested upgrade ▶ User requested shutdown ▶ Unknown <p>There may be additional information in the diagnostics data.</p>

gatekeeper.query

Retrieves the gatekeeper settings and current status for an MCU. Takes no parameters.

Response	Type	Comments
gatekeeperUsage	String	One of disabled, enabled or required.

Optional parameters – only present if gatekeeperUsage is not disabled .

address	String	The address of the gatekeeper.
dnsStatus	String	The status of the DNS resolution: one of inProgress, resolved or failed.
ip	String	If "dnsStatus" is resolved. Contains the IP address of the gatekeeper.
activeRegistrations	Integer	The number of active registrations.
pendingRegistrations	Integer	The number of registrations in progress.
registrationPrefix	String	The registration prefix used by the MCU.
registrationType	String	The value of the "Gatekeeper registration type" setting as seen on Settings > h.323 web UI page.

Response	Type	Comments
		Possible values: <code>terminalGateway</code> (corresponds to Terminal / gateway on the web UI) <code>gateway</code> <code>gatewayCisco</code> (corresponds to gateway (Cisco GK compatible)) <code>mcuStandard</code> (corresponds to MCU (Standard)) <code>mcuCompatible</code> (corresponds to MCU (Compatible)).
<code>portAssociationA</code>	Boolean	<code>true</code> if interface 'PortA IPv4' is associated with the H.323 gatekeeper
<code>portAssociationB</code>	Boolean	<code>true</code> if interface 'PortB IPv4' is associated with the H.323 gatekeeper
<code>portAssociationAv6</code>		<code>true</code> if interface 'PortA IPv6' is associated with the H.323 gatekeeper
<code>portAssociationBv6</code>		<code>true</code> if interface 'PortB IPv6' is associated with the H.323 gatekeeper
<code>sendResourceAvailabilityIndications</code>	Boolean	Shows whether or not the MCU will send resource availability indications
<code>availabilityThresholdConferences</code> <code>availabilityThresholdVideoPorts</code>	Integer	These are the thresholds that determine availability. They are only returned if the MCU has been set to send resource availability indications and if the threshold is not blank.
<code>registeredAddress</code>	String	The IP address and port that the MCU has registered with the gateway. This value is only returned if the MCU is registered.
<code>alternateGatekeepers</code>	Integer	The number of alternate gatekeepers
<code>resourceAvailabilityStatus</code>	String	One of three values indicating whether the MCU is currently available. Possible values: <code>available</code> , <code>unavailable</code> or <code>disabled</code> (for when resource availability indications are disabled)
<code>h323ID</code>	String	The h323 ID used by the MCU.
<code>mcuServicePrefix</code>	String	The service prefix used by the MCU.
<code>scheduledConferenceIDRegistration</code>	String	The value enabled or disabled; corresponds to web interface "ID registration for scheduled conferences" option.

Response	Type	Comments
h323IDStatus	String	The current status of the ID/service prefix registration process. One of idle, registering, registered, deregistering, pendingReregistration, waitingRetry, noID or idTooLong.
mcuServicePrefixStatus	String	

gateway.enumerate

Enumerates configured H.323 gateways on an MCU.

Parameter	Type	Comments
Optional parameters		
enumerateID	String	The value returned by the last enumeration call. If it is omitted, a new enumeration is started.

This call returns:

Response	Type	Comments
gateways	Array	See below for details.
Optional parameters		
enumerateID	String	The value which should be used in the next call to get the next set of data. If this is omitted, no further data is available from the MCU.

The array “gateways” contains structures with the following fields:

Field	Type	Comments
name	String	The name of the configured gateway.
address	String	The gateway’s E.164 directory number, hostname or IP address.
conferencingParameters	Array	See below for details.

The array conferencingParameters contains structures with the following fields:

Field	Type	Comments
useDefaultMotionSharpness	Boolean	If true , this endpoint will use box-wide default motion sharpness settings.
minFrameRateMotionSharpness	Integer	Only present if “useDefaultMotionSharpness” is false. Specifies the minimum frame rate for this endpoint.

Field	Type	Comments
maxMediaTxBitRate	Integer	Max media transmit bit rate.
maxMediaRxBitRate	Integer	Max media receive bit rate.

participant.add

Adds a participant to a conference. All participants in a conference must have a “participantName” that is unique to the conference but it need not be unique across all conferences.

Participants can be added before or during a conference. A participant which is added at any time via the API will be added to the configured list of participants, and thus will be called at the start of the conference by the MCU for any conference which has any sort of repetition; to avoid this, a participant must be removed directly using participant.remove.

Note: If a participantName matches the name of an endpoint in the list of configured endpoints (go to **Endpoints** in the web interface) the two are treated as unrelated. This is because in the web interface named, configured, endpoints have the participantType value by_name, whereas API participants are of type by_address.

Parameter	Type	Comments
conferenceName	String	The name of the conference to which to add the participant.
participantName	String	The name of the participant to be added. This must be a unique value, i.e. not the same as any existing participant. Note that for ad_hoc participants, this is not used, but must be present otherwise.
Optional parameters		
participantProtocol	String	If present, must be h323, sip or vnc – these are the only protocols that the API can currently use.
participantType	String	If present, must be by_address or ad_hoc. Note that if this conference is an ad_hoc conference, this value should also be ad_hoc. Ad hoc participants can only be added to active conferences.
address	string (< 64 chars)	The participant's E.164 directory number, hostname or IP address.
gatewayAddress	string (< 64 chars)	IP address or hostname of an H.323 gateway.
useSIPRegistrar	Boolean	Whether to use a registrar in making this a call. (Ignored if the protocol is not sip)
transportProtocol	String	One of: default, tcp, udp or tls. (Ignored if the protocol is not SIP).

Parameter	Type	Comments
password	String	The password for VNC endpoints.
deferConnection	Boolean	If true, don't call out to this participant immediately, but wait for a "participant.connect" command.
All of the following parameters are optional, and control the conferencing behaviour of the MCU with respect to the endpoint in question; for example, the maximum resolution of the video streams used, or whether the participant is able to control their conference view layout.		
addAsGuest	Boolean	Whether or not this participant is added as a guest when the MCU calls out to it. Set <code>true</code> if the participant is to be a guest, set <code>false</code> if the participant is to be a chair.
actAsRecorder	Boolean	Whether or not this participant will appear as a recorder. Set <code>true</code> if the participant should appear to other participants as a recorder.
maxBitRateToMCU	Integer	The maximum bit rate to the MCU specified as kbit/s.
maxBitRateFromMCU	Integer	The maximum bit rate from the MCU specified as kbit/s.
motionSharpnessTradeoff	String	One of <code>default</code> (to use the global default setting), <code>preferMotion</code> , <code>preferSharpness</code> and <code>balanced</code> .
displayNameOverrideStatus	Boolean	If true, use the specified "displayNameOverrideValue" text as the participant's display name during the conference.
displayNameOverrideValue	String (< 32 chars)	Value to use as the participant's display name (if "displayNameOverrideStatus" set to true).
cpLayout	String	This sets the initial conference view layout for the video sent to this participant. Refer to <i>Conference layouts</i> on page 109 for the full list of available layouts.
layoutControlEx	String	Controls whether and how view layout can be controlled. One of: <ul style="list-style-type: none"> ▶ <code>disabled</code>: Layout control is disabled. ▶ <code>feccOnly</code>: Layout can be controlled via FECC. ▶ <code>dtmfOnly</code>: Layout can only be controlled via DTMF. ▶ <code>feccAndDtmf</code>: Layout can be controlled via FECC or DTMF if FECC is unavailable. ▶ <code>feccWithDtmfFallback</code> for using FECC when it is available and DTMF for endpoints which don't have FECC

Parameter	Type	Comments
		<ul style="list-style-type: none"> ▶ <code>bothFeccAndDtmf</code> to enable both FECC and DTMF controls
<code>audioRxMuted</code>	Boolean	1 (true) means that audio from this participant will not be heard by other conference participants.
<code>audioRxGainMode</code>	String	One of: none – no extra gain applied automatic – automatic gain control applied fixed – fixed number of dBs of gain applied.
<code>audioRxGainMillidB</code>	Integer	If audio gain mode is fixed, this is the number of decibels of gain applied, multiplied by 1000, and can be a negative value.
<code>videoRxMuted</code>	Boolean	true means that video from this participant will not be seen by other conference participants.
<code>videoTxWidescreen</code>	Boolean	If true, the video sent to this participant will be in a form suitable for a widescreen (16:9) display.
<code>videoTxMaxResolution</code>	String	One of: cif, 4cif or max.
<code>videoRxMaxResolution</code>	String	Same as above.
<code>autoConnect</code>	Boolean	If this is true and a participant whose E.164, DNS, or IP address matches this participant's address dials into the MCU, it will be moved directly to this conference. In order to stop the MCU dialing out to the participant, as the conference starts, use <code>deferConnection</code> .
<code>autoDisconnect</code>	Boolean	When set to true, the participant will be disconnected from the conference if another participant disconnects and only participants configured to be automatically disconnected remain in the conference.
<code>borderWidth</code>	Integer	0 (no border), or 1, 2, or 3 for +1/+2/+3.
<code>dtmfSequence</code>	String	This sets the DTMF sequence used for dialing with an audio bridge.
<code>linkType</code>	String	Currently, must be one of: <code>cascadeSlaveToMaster</code> or <code>default</code> . (Currently this is only taken note of if <code>participantType</code> is <code>by_address</code>).
<code>suppressDtmfEx</code>	String	Controls the muting of DTMF tones. One of: fecc : DTMF tones are muted when DTMF is being used to control layout but far end camera control (FECC) is not available always : DTMF tones are always muted

Parameter	Type	Comments
		<p>never: DTMF tones are never muted</p> <p>default: The setting specified for this parameter when the conference is created. All new participants take this setting.</p>
h239Negotiation	String	<p>When exchanging content with an endpoint in a H.323 call, the MCU acts as a master unit and the endpoint as a slave unit for the purpose of H.239 token negotiation. However, in order for the MCU to exchange content with a cascaded third party MCU, the MCU must appear to the third party MCU to be a slave unit.</p> <p>The MCU can be configured as a true slave, in which case content will only be sent if the third party MCU master accepts the token request, or as a mimic slave where content is sent to all other connected endpoints even if the third party MCU rejects the token request.</p> <p>The string can be one of three values:</p> <ul style="list-style-type: none"> ▶ <i>As master:</i> The MCU only acts as master in H.239 token negotiation. ▶ <i>As slave:</i> The MCU acts as the slave in H.239 token negotiation and can send content to a master unit if it accepts the token request. ▶ <i>Mimic slave:</i> The MCU acts as a mimic slave in H.239 token negotiation and will try to send content to all other endpoints/units even if this unit (i.e. the MCU configured as a mimic slave) rejects the token request.

Deprecated parameters

Parameter	Type	Comments
layoutControlEnabled	Boolean	Controls whether this participant is able to change the conference view layout that they see; 1 (true) means that the participant can change the layout using FECC or DTMF, 0 (false) means that they cannot. Deprecated in favour of layoutControlEx.

participant.connect

Used primarily for API-configured participants with deferConnection set to TRUE, but can also be used to reconnect disconnected participants.

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	
participantName	String	
participantProtocol	String	
participantType	String	

participant.diagnostics

Returns diagnostic information about a given participant.

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	
participantName	String	
participantProtocol	String	
participantType	String	

The call response returns the following:

Response	Type	Comments
videoTxFrameRate	Integer	
videoRxFrameRate	Integer	
videoRxFramesReceived	Integer	
videoTxChannelBitRate	Integer	
videoTxSelectedBitRate	Integer	
videoTxActualBitRate	Integer	

Response	Type	Comments
videoTxBitRateLimitReason	String	One of: notLimited, viewedSize, quality, aggregateBandwidth, flowControl or endpointLimitation.
videoRxChannelBitRate	Integer	
videoRxSelectedBitRate	Integer	
videoRxActualBitRate	Integer	
videoRxBitRateLimitReason	String	One of: notLimited, viewedSize, quality, aggregateBandwidth, flowControl or endpointLimitation.
videoTxWidth	Integer	
videoTxHeight	Integer	
videoTxInterlaced	Boolean	
videoRxWidth	Integer	
videoRxHeight	Integer	
videoRxInterlaced	Boolean	
videoTxReportedLost	Integer	
videoRxCodec	String	
videoRxJitter	Integer	
audioTxReportedLost	Integer	
videoTxSent	Integer	
audioRxLost	Integer	
audioRxReceived	Integer	
videoTxCodec	String	
videoRxFramesReceivedWithErrors	String	
audioTxSent	Integer	

Response	Type	Comments
videoRxReceived	Integer	
videoRxLost	Integer	
contentRxType	String	Indicates the type of content this participant is sending: none, h239 or bfcv No other contentRx fields will be returned if this value is none.
contentRxCodec	String	The codec used on the incoming content stream from this participant
contentRxWidth	Integer	Horizontal resolution of incoming content
contentRxHeight	Integer	Vertical resolution of incoming content
contentRxFrameRate	Integer	Frame rate of incoming content
contentRxActualBitRate	Integer	Actual speed of incoming content in bps
contentRxChannelBitRate	Integer	Capacity of channel in bps
contentRxSelectedBitRate	Integer	Participant-selected content bitrate. If one is not set, the MCU assumes the content should be received as fast as possible.
contentRxBitRateLimitReason	String	Provides a reason if the content channel's received bit rate is limited. One of: <ul style="list-style-type: none"> ▶ notLimited ▶ viewedSize ▶ quality ▶ aggregateBandwidth ▶ flowControl ▶ endpointLimitation
contentRxJitter	Integer	A measure of the jitter in the received content
contentRxFramesReceived	Integer	Number of received content frames
contentRxFramesReceivedWithErrors	Integer	Number of received content frames that had errors
contentRxReceived	Integer	Number of content packets received from this participant
contentRxLost	Integer	Number of content packets that should have been received from this participant

Response	Type	Comments
		that were not
contentTxType	String	Indicates the type of content being sent to the participant: none, h239, bfcP, or mainVideo No other contentTx fields will be returned if this value is either none or mainVideo.
contentTxCodec	String	The codec used on the outgoing content stream to this participant
contentTxWidth	Integer	Horizontal resolution of outgoing content
contentTxHeight	Integer	Vertical resolution of outgoing content
contentTxFrameRate	Integer	Frame rate of outgoing content
contentTxActualBitRate	Integer	Actual speed of outgoing content in bps
contentTxChannelBitRate	Integer	Capacity of channel in bps
contentTxSelectedBitRate	Integer	Participant-selected content bitrate. If one is not set, the MCU assumes the content should be sent as fast as possible.
contentTxBitRateLimitReason	String	Provides a reason if the content channel's received bit rate is limited. One of: <ul style="list-style-type: none"> ▶ notLimited ▶ viewedSize ▶ quality ▶ aggregateBandwidth ▶ flowControl ▶ endpointLimitation
contentTxSent	Integer	Number of content packets sent
contentTxReportedLost	Integer	Number of content packets reported as lost
contentTxError	String	Information about problems with outgoing content. One of : notAllowed noCommonCodecs noCommonFormats noCommonSymmetricCodecs modeMismatch bitRateMismatch encryptionNotPossible

Response	Type	Comments
		notPossible These correspond to the messages shown on the participant page of the web UI

participant.disconnect

This call causes the MCU to tear down its connection to the specified participant, if such a connection exists. This is different from participant.remove above because:

- ▶ In the case of configured participants, it does not remove the configuration (thus allowing later re-connection with participant.connect).
- ▶ In the case of ad hoc participants, it does not remove the record of the previous connection.

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	
participantName	String	
participantProtocol	String	
participantType	String	

participant.enumerate

Returns data about participants in conferences on the MCU. Several calls may be required to receive data about all participants; see the notes on `enumerateID` below.

Note: The `participant.enumerate` call has deprecated behaviour if there is no `operationScope` parameter in the call. See *participant.enumerate* on page 99.

Parameter	Type	Comments
<code>operationScope</code>	array of strings	This should contain none, either or both of <code>currentState</code> or <code>configuredState</code> . If <code>currentState</code> is present, the active configuration of each participant is returned by the MCU in the <code>currentState</code> structure. If <code>configuredState</code> is present, the stored configuration is returned in the <code>configuredState</code> structure
Optional parameters		
<code>enumerateFilter</code>	String	An enumerate filter string.
<code>enumerateID</code>	String	The value returned by the last enumeration call. If this parameter is omitted, a new enumeration is started.

Valid expressions within the enumerate filter are as follows:

Expression	Type	Comments
<code>connected</code>	Boolean	True if the participant is currently connected to a conference.
<code>disconnected</code>	Boolean	True if the participant has been connected to a conference, but is now disconnected.
<code>connecting</code>	Boolean	True if the scheduled participant is in the process of connecting.

Note: A participant that has not yet connected to a conference (for example, they have deferred connection specified) is neither connected nor disconnected.

The response only includes the `participants` array if there are participants to enumerate. If there are participants, the response includes the following data:

Response	Type	Comments
<code>participants</code>	Array	See below for details.
Optional responses		
<code>enumerateID</code>	String	The value which should be used in the next call to get the next set of data. If this is not present, there is no further data available from the MCU.

participants array members

The members of the `participants` array contain the following structures:

Field	Type	Comments
participantName	string	Participant identification as described above.
participantProtocol	String	
participantType	String	
conferenceName	String	
autoAttendantUniqueld	String	
connectionUniqueld	Integer	Corresponds to the uniqueld returned by a conference or autoattendant.
Optional parameters		
currentState	Array	The current state of the participant as used by the MCU. Details of this struct are given below. This is only present if requested in the operationScope
configuredState	Array	The stored configuration of the participant, if any. Details of this struct are given below. This is only present if requested in the operationScope

If the endpoint is not configured, the `configuredState` structure is empty; otherwise the `configuredState` structure contains the following entries:

Field	Type	Comments
address	String	The address used to connect to the remote endpoint in question. Only returned when the address is known.
gatewayAddress	String	
useSipRegistrar	Boolean	Whether to use a registrar in making this a call.
transportProtocol	String	One of: default, tcp, udp or tls.
password	String	The password for vnc endpoints.
deferConnection	Boolean	true if this participant's connection is being deferred.
displayNameOverrideStatus	Boolean	Indicates whether the displayName value is the result of being overridden.
maxBitRateToMCU	Integer	As for "participant.add"; in kbps.

Field	Type	Comments
maxBitRateFromMCU	Integer	
motionSharpnessTradeoff	String	One of <code>default</code> (if set to the global default setting), <code>preferMotion</code> , <code>preferSharpness</code> and <code>balanced</code> .
audioRxMuted	Boolean	
audioRxGainMode	String	One of <code>fixed</code> , <code>none</code> or <code>automatic</code> .
audioRxGainMillidB	Integer	Only returned if <code>audioRxGainMode</code> is <code>fixed</code> .
videoRxMuted	Boolean	
videoTxWidescreen	Boolean	
layoutControlEx	Boolean	Whether and how view layout can be controlled. One of: <ul style="list-style-type: none"> ▶ <code>disabled</code>: Layout control is disabled. ▶ <code>feccOnly</code>: Layout can be controlled via FECC. ▶ <code>dtmfOnly</code>: Layout can only be controlled via DTMF. ▶ <code>feccAndDtmf</code>: Layout can be controlled via FECC or DTMF if FECC is unavailable. ▶ <code>feccWithDtmfFallback</code> for using FECC when it is available and DTMF for endpoints which don't have FECC ▶ <code>bothFeccAndDtmf</code> to enable both FECC and DTMF controls
actAsRecorder	Boolean	Whether or not this participant will appear as a recorder. Will be <code>true</code> if the participant appears to other participants as a recorder.
cpLayout	String	The layout configured for this participant. Refer to <i>Conference layouts</i> on page 109 for the full list of available layouts.
autoConnect	Boolean	Whether or not participants matching this address should be automatically connected to the conference.
autoDisconnect	Boolean	Whether or not the participant should be automatically disconnected from the conference when all other participants disconnect.

Field	Type	Comments
borderWidth	Integer	0 (no border), or 1, 2, or 3 for +1/+2/+3.
linkType	String	One of: cascadeSlaveToMaster or default.
dtmfSequence	String	This sets the DTMF sequence used for dialing with an audio bridge.
suppressDtmfEx	String	Controls the muting of DTMF tones. One of: fecc : DTMF tones are muted when DTMF is being used to control layout but far end camera control (FECC) is not available always : DTMF tones are always muted never : DTMF tones are never muted default : The setting specified for this parameter when the conference is created. All new participants take this setting.
h239Negotiation	String	When exchanging content with an endpoint in a H.323 call, the MCU acts as a master unit and the endpoint as a slave unit for the purpose of H.239 token negotiation. However, in order for the MCU to exchange content with a cascaded third party MCU, the MCU must appear to the third party MCU to be a slave unit. The MCU can be configured as a true slave, in which case content will only be sent if the third party MCU master accepts the token request, or as a mimic slave where content is sent to all other connected endpoints even if the third party MCU rejects the token request. The string can be one of three values: <ul style="list-style-type: none"> ▶ <i>As master</i>: The MCU only acts as master in H.239 token negotiation. ▶ <i>As slave</i>: The MCU acts as the slave in H.239 token negotiation and can send content to a master unit if it accepts the token request. ▶ <i>Mimic slave</i>: The MCU acts as a mimic slave in H.239 token negotiation and will try to send content to all other endpoints/units even if this unit (i.e. the MCU configured as a mimic slave) rejects the token request.

The currentState structure contains the following responses, if present.

Field	Type	Comments
address	String	The address used to connect to the remote

Field	Type	Comments
gatewayAddress	String	endpoint in question. Only returned when the address is known (i.e. the participant was or is to be called out by the MCU, or the participant is an ad_hoc participant calling in which provided an address).
ipAddress	String	The IP address to which the MCU is connected for this endpoint - this will usually be the endpoint itself, but may be a gatekeeper or gateway. Only present for active participants.
displayName	String (< 32 characters)	The name used by the endpoint to identify itself. This may be different to the participantName. Only available after the participant has connected.
guest	Boolean	true is this participant is a guest, false if the participant is a chair.
remoteLinkType	String	The participant may be one of the following: slave conference autoAttendant recording playback
displayNameOverrideStatus	Boolean	Indicates whether the displayName value is the result of being overridden.
maxBitRateToMCU	Integer	As for "participant.add"; in kbps.
maxBitRateFromMCU	Integer	
motionSharpnessTradeoff	String	One of default (if set to the global default setting), preferMotion , preferSharpness and balanced .
callState	String	One of: dormant , alerting , connecting , connected or disconnected . When dormant, the callDirection field is not returned.
connectTime	dateTime.iso8601	Only returned after the participant is connected. This value is always present if the call state is connected . It may or may not be defined for participants in the disconnected state, depending on whether they were ever connected.
disconnectTime	dateTime.iso8601	Only returned after the participant has disconnected.
disconnectReason	String	Only returned after the participant has disconnected; this contains one of the

Field	Type	Comments
		disconnect reason strings given in section 8.
connectPending	Boolean	true if sending a “participant.connect” command for this participant will cause either the initial connection to that endpoint (in the event that it was configured with “deferConnection” set) or a re-connection to that endpoint (in the event that it has disconnected).
audioRxCodec	String	
audioRxLost	Integer	
audioRxReceived	Integer	
audioTxCodec	String	
audioTxReportedLost	Integer	
audioTxSent	Integer	
audioRxMuted	Boolean	
audioRxGainMode	String	One of fixed , none or automatic .
audioRxGainMillidB	Integer	Only present if the audioRxGainMode is fixed .
audioTxMuted	Boolean	true if audio is not being transmitted to this participant.
videoRxCodec	String	
videoRxLost	Integer	
videoRxReceived	Integer	
videoTxCodec	String	
videoTxReportedLost	Integer	
videoTxSent	Integer	
videoRxMuted	Boolean	
videoTxWidescreen	Boolean	

Field	Type	Comments
contentRxType	String	Indicates the type of content this participant is sending: none, h239 or bfcv No other contentRx fields will be returned if this value is none.
contentRxCodec	String	The codec used on the incoming content stream from this participant
contentRxReceived	Integer	Number of content packets received from this participant
contentRxLost	Integer	Number of content packets that should have been received from this participant that were not
contentTxType	String	Indicates the type of content being sent to the participant: none, h239, bfcv, or mainVideo No other contentTx fields will be returned if this value is either none or mainVideo.
contentTxCodec	String	The codec used on the outgoing content stream to this participant
contentTxSent	Integer	Number of content packets sent
contentTxReportedLost	Integer	Number of content packets reported as lost
autoDisconnect	Boolean	
important	Boolean	
activeSpeaker	Boolean	true if this participant is currently the active speaker in the conference.
lecturer	Boolean	Whether this participant is the lecturer or not. Either true: This participant is the lecturer. false: This participant is not the lecturer.
layoutControlEx	Boolean	Whether and how view layout can be controlled. One of: <ul style="list-style-type: none"> ▶ disabled: Layout control is disabled. ▶ feccOnly: Layout can be controlled via FECC. ▶ dtmfOnly: Layout can only be controlled via DTMF. ▶ feccAndDtmf: Layout can be controlled via FECC or DTMF if FECC is unavailable.

Field	Type	Comments
		<ul style="list-style-type: none"> ► <code>feccWithDtmfFallback</code> for using FECC when it is available and DTMF for endpoints which don't have FECC ► <code>bothFeccAndDtmf</code> to enable both FECC and DTMF controls
<code>activeConferenceId</code>	String	The active conference ID of the current conference – see conference.enumerate for details of this field. This field is only present if the participant is currently in an active conference.
<code>currentLayout</code>	Integer	The actual layout in use for the video stream being sent by the MCU to this participant. This parameter will not be present if the participant is in an auto attendant rather than a conference, or if the MCU is not currently transmitting video to the participant in question. Refer to <i>Conference layouts</i> on page 109 for the full list of available layouts..
<code>layoutSource</code>	String	This will be one of <code>family<x></code> , <code>conferenceCustom</code> , or <code>participantCustom</code> , and describes the reason for the current layout. This parameter is only present if the <code>currentLayout</code> parameter is also present, i.e. if the participant is in an active conference.
<code>callDirection</code>	String	Either <code>incoming</code> or <code>outgoing</code> . When the <code>callState</code> field is dormant, the <code>callDirection</code> field is not returned.
<code>previewURL</code>	String	The location of the preview image; this is not a complete URL, and requires a prefix of <code>http://<hostname></code> (where <code>hostname</code> is the hostname of this MCU) before it is used.
<code>focusType</code>	String	One of: <code>participant</code> , <code>voiceActivated</code> or <code>h239</code> .
<code>focusParticipant</code>	Struct	Only present if <code>focusType</code> is <code>participant</code> . This structure contains participant identification members (i.e. <code>conferenceName</code> , <code>participantName</code> , <code>participantType</code> and <code>participantProtocol</code>).
<code>callIdentifier</code>	base64	The base64 encoded GUID (globally unique identifier) of the active H.323 call from this endpoint.
<code>borderWidth</code>	Integer	0 (no border), or 1, 2, or 3 for +1/+2/+3.
<code>autoAttendantConfiguredName</code>	String	If this participant is connected to an auto attendant, this field holds the name of that

Field	Type	Comments
		auto attendant: the value will change as the user navigates through an MCU's configured menu structure.
mediaEncryption	String	One of the following: encrypted : all media channels to and from this endpoint are encrypted unencrypted : all media channels to and from this endpoint are encrypted mixed : some channels are encrypted and some not unknown : none of the above; this may occur when a participant has very recently connected and no media channels have been established yet
audioRxEnergyMillidB	Integer	The measured energy of a participant's audio sent to the MCU. Typically this will be a negative value in the range -30000 (-30dB for very quiet) and 0 (very loud).
audioRxMutedRemotely	Boolean	Whether this endpoint is muted remotely.
packetLossWarning	Boolean	This will be true if any packet loss has been seen within the last 15 seconds.
packetLossCritical	Boolean	This will be true if any packet loss above a certain level (5%) is seen within the last five seconds.

Note: This participant information is returned for all participants added to the conference using the participant.add call, even after they have disconnected. However, this information is only returned for other participants (i.e. those added via the web interface or those who dialled into the conference) whilst they are connected but not after they have disconnected.

Deprecated parameters

Parameter	Type	Comments
layoutControlEnabled	Boolean	Deprecated by layoutControlEx

participant.fecc

Controls far end camera control (FECC).

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	

Parameter	Type	Comments
participantName	String	
participantProtocol	String	
participantType	String	
direction	String	One of: up, down, left, right, zoomIn, zoomOut, focusIn, focusOut.

participant.message

Puts a message on the display of a given participant.

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	
participantName	String	
participantProtocol	String	
participantType	String	
message	String (length <256)	The string to send to the participant.
Optional parameters		
verticalPosition	String	Specifies where to show the message: "top", "middle" or "bottom". Message is always horizontally centered, and omitting this parameter is equivalent to choosing "middle".
durationSeconds	Integer	The length of time, in seconds, to display the message. This defaults to 30 seconds.

participant.modify

Depending on the operationScope parameter below, this call modifies the configuration of a participant (configuredState), or the active state of a participant in a conference (activeState).

For example, if the parameter layoutControlEnabled is included in a call to participant.modify, then the effect of the call will depend on operation scope as follows:

- If operationScope is **activeState**, the active participant's ability to control their layout will immediately change, but the configured value will remain unchanged, so that if they were to reconnect later, the state of layoutControlEnabled would revert back to how it is in the configuration.

- If operationScope is **configuredState**, the participant's current ability to control their layout will be unaffected, but their configuration will be changed so that in future occurrences of the conference (or when the participant is reconnected) they will have the newly configured state.

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	
participantName	String	
participantProtocol	String	
participantType	String	
operationScope	String	One of activeState or configuredState. This parameter specifies the scope of the changes to be made, be they to the configured state of an endpoint, or to the active state of a participant in a conference.
address	String	All these parameters are optional. They should not be present if operationScope is activeState. These parameters override the configured values.
gatewayAddress	String	
useSipRegistrar	Boolean	
transportProtocol	String	
password	String	
deferConnection	Boolean	
autoConnect	Boolean	
linkType	String	
maxBitRateToMCU	Integer	
maxBitRateFromMCU	Integer	
addAsGuest	Boolean	One of default (if set to the global default setting), preferMotion , preferSharpness and balanced . Optional, and valid for both configuredState and activeState scopes.
actAsRecorder	Boolean	
motionSharpnessTradeoff (optional)	String	
displayNameOverrideStatus	Boolean	Refer to the participant.add call for definitions of

Parameter	Type	Comments
displayNameOverrideValue	String (< 32 characters)	these parameters. All of these parameters are optional, and override or change the values provided in the "participant.add" call. Depending on the value of the operationScope parameter, these either, if configuredState, change the stored configuration of a participant, or, if activeState, change the active participant state, resulting in real-time changes to that participant.
cpLayout	String	
audioRxMuted	Boolean	
audioRxGainMode	String	
audioRxGainMillidB	Integer	
videoRxMuted	Boolean	
videoTxWidescreen	Boolean	
autoDisconnect	Boolean	
dtmfSequence	String	This sets the DTMF sequence used for dialing with an audio bridge.
Optional parameters		
important	Boolean	This setting should not be present if operationScope is "configuredState". Specifies whether this participant is important.
audioTxMuted	Boolean	This setting should not be present if operationScope is "configuredState".
borderWidth	Integer	0 (no border), or 1, 2, or 3 for +1/+2/+3.
focusType	String	One of: voiceActivated, h239 or participant.
focusParticipant	Struct	A participant identification structure (i.e. with conferenceName, participantName, participantProtocol and participantType members). Should only be present if focusType is participant.
suppressDtmfEx	String	Controls the muting of DTMF tones. One of: fecc : DTMF tones are muted when DTMF is being used to control layout but far end camera control (FECC) is not available always : DTMF tones are always muted default : The setting specified for this parameter when the conference is created. All new participants take this setting.

Parameter	Type	Comments
layoutControlEx	String	<p>Controls whether and how view layout can be controlled. One of:</p> <ul style="list-style-type: none"> ▶ <code>disabled</code>: Layout control is disabled. ▶ <code>feccOnly</code>: Layout can be controlled via FECC. ▶ <code>dtmfOnly</code>: Layout can only be controlled via DTMF. ▶ <code>feccAndDtmf</code>: Layout can be controlled via FECC or DTMF if FECC is unavailable. ▶ <code>feccWithDtmfFallback</code> for using FECC when it is available and DTMF for endpoints which don't have FECC ▶ <code>bothFeccAndDtmf</code> to enable both FECC and DTMF controls
h239Negotiation	String	<p>When exchanging content with an endpoint in a H.323 call, the MCU acts as a master unit and the endpoint as a slave unit for the purpose of H.239 token negotiation. However, in order for the MCU to exchange content with a cascaded third party MCU, the MCU must appear to the third party MCU to be a slave unit.</p> <p>The MCU can be configured as a true slave, in which case content will only be sent if the third party MCU master accepts the token request, or as a mimic slave where content is sent to all other connected endpoints even if the third party MCU rejects the token request.</p> <p>The string can be one of three values:</p> <ul style="list-style-type: none"> ▶ <i>As master</i>: The MCU only acts as master in H.239 token negotiation. ▶ <i>As slave</i>: The MCU acts as the slave in H.239 token negotiation and can send content to a master unit if it accepts the token request. ▶ <i>Mimic slave</i>: The MCU acts as a mimic slave in H.239 token negotiation and will try to send content to all other endpoints/units even if this unit (i.e. the MCU configured as a mimic slave) rejects the token request.

If there is no `operationScope` parameter, the MCU will attempt to change both active and configured states. This is deprecated behaviour, and should not be relied upon.

Deprecated parameters

Parameter	Type	Comments
layoutControlEnabled	Boolean	Controls whether this participant is able to change the conference view layout that they see; 1 (true) means that the participant can

Parameter	Type	Comments
		change the layout using FECC or DTMF, 0 (false) means that they cannot.

participant.move

Moves a participant from one conference to another.

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	
participantName	String	
participantProtocol	String	
participantType	String	
newConferenceName	String	The name of the conference to move the participant to.

This will only move an active participant. Even if this participant is preconfigured, the configuration is unchanged.

A fault code of "no such participant" is returned when the participant isn't found, "too many participants" when the conference has reached its limit and "operation failed" for other move failures such as moving an unencrypted participant into a conference which requires encryption.

participant.remove

Removes a participant from the database of configured participants, and also removes this participant from any conferences. It will also remove all records of this participant's presence in a conference.

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	
participantName	String	
participantProtocol	String	
participantType	String	

participant.status

Returns information about an individual participant on the MCU.

Parameter	Type	Comments
conferenceName	String	Participant identification as described above.
autoAttendantUniqueld	String	
participantName	String	
participantProtocol	String	
participantType	String	
operationScope	Array of strings	This should contain none, either, or both of currentState or configuredState. If currentState is present, the active configuration of each participant is returned by the MCU in the currentState structure. If configuredState is present, the stored configuration is returned in the configuredState structure.

This call returns a struct as described in [participant.enumerate](#) above, containing information about the participant indicated.

A fault code of “no such participant” is returned if the participant does not exist.

services.query

This call returns the services information as seen on the **Network > Services** web page. The response contains an array named `ports` which contains a `struct` for each network port on the MCU. Each `struct` contains a `port` string which identifies the port (A or B), a `protocol` string (IPv4 or IPv6), and an array of structures that contain the service details for that port and protocol.

ports array

Parameter	Type	Comments
<code>ports</code>	Array	An array whose members are structures representing the Ethernet ports on the device

port struct

<code>port</code>	String	Identifies the Ethernet port. May be A or B.
<code>protocol</code>	String	Identifies the addressing protocol used on that Ethernet port. May be IPv4 or IPv6.
<code>services</code>	Array	An array whose members represent the web services provided on the particular port and protocol.

services array members

<code>enabled</code>	Boolean	<code>true</code> if the service is enabled on the port
<code>type</code>	String	The type of service, either <code>tcp</code> or <code>udp</code>
<code>name</code>	String	The name of the service, for example <code>ftp</code> .
<code>port</code>	Integer	The port number on which the service is enabled, for example 21. The port number is only returned if <code>enabled</code> is <code>true</code> .

sip.query

Retrieves information on SIP configuration for an MCU. Takes no parameters.

Response	Type	Comments
<code>configuredRegistrar</code>	String	The currently configured SIP registrar address. This corresponds to the “SIP registrar address” on the Settings > SIP web page, and will be an empty string value if there is no currently configured SIP registrar.
<code>configuredProxy</code>	String	The currently configured SIP proxy address. This corresponds to the “SIP proxy address” on the Settings > SIP web page, and will be an empty

Response	Type	Comments
		string value if there is no currently configured SIP proxy.
conferenceRegistration	String	This value is only present if the MCU being queried is an MCU. It will be enabled if the MCU is configured to register conferences' numeric IDs with the configured SIP registrar, and disabled if not. The enabled value corresponds to "SIP registration settings" being set to "Allow conference registration" on the Settings > SIP page.
registrarContactURI	String	The URI used to register.
registrarContactDomain	String	The domain portion of the URI used to register.
registrarUsage	Boolean	Shows whether or not SIP registrar usage is enabled
registrarType	String	One of three values indicating the type of SIP registrar: normal, lcs or siemens
maxOcsBitrate	Integer	The bitrate to use for ocs and lcs clients, in bits per second.
outgoingTransport	String	One of three values indicating the type of outgoing transport protocol: udp, tcp or tls
useLocalCertificate	Boolean	Shows whether or not the MCU has been set to use the local certificate for connections and registrations
registrationStatus	String	One of four values indicating the actual registration status: registering, registered, unregistered or unknown

template.create

Creates a new template with the required `templateName` string parameter and returns the `templateNumber` of the new template.

All other parameters are the same as those in the `template.modify` call.

If you don't specify the `parent` parameter (takes the template name string), the new template will use the top level template as its parent.

Parameter	Type	Comments
templateName	String	Required. The name of the template.

Parameter	Type	Comments
parent	String	The name of the parent template. Defaults to Top Level template if omitted.

template.delete

Deletes a template with the provided `templateName` or `templateNumber` parameter. You may only pass one reference.

You can't delete the top level or ad hoc template. The call will return an error if it can't find the template or if you pass an invalid reference (see fault codes).

Parameter	Type	Comments
templateName	String	The name of the template you want to delete. Either the <code>templateName</code> or <code>templateNumber</code> parameter is required.
templateNumber	Integer	The number of the template you want to delete.

template.modify

This call modifies the settings for conference templates (top level and ad hoc). If the `default` value is passed, the template will inherit its parent's setting for that parameter.

This call returns an error if both `maximumVideoPorts` and `maximumAudioPorts` are set to 0 or if the total number of ports exceeds the maximum conference size (currently 80).

Parameter	Type	Comments
templateNumber	Integer	Identifies the template to be modified. You can use 0 for the top level template and higher numbers for other stored templates. Template numbers are not preserved when the MCU reboots.
newTemplateName	String	Use this parameter to change the name of the template. The call will return an error if another template exists that has this name.
parent	String	The <code>templateName</code> of the parent template. You can use this parameter to move a template within the tree (as seen on the MCU's Conferences > Templates page). The ad hoc template can be moved.
startLocked	String	Defines whether or not conferences based on this template should be locked when they start. Accepts <code>true</code> , <code>false</code> and <code>default</code> . Set <code>true</code> if you want it to start in the locked state. Set <code>default</code> if you want the template to inherit its parent's setting.

Parameter	Type	Comments
registerWithGatekeeper	String	Registers the conference's "numericId" with the gatekeeper. True, false, or default.
registerWithSIPRegistrar	String	Registers this conference with the SIP registrar. True, false, or default.
private	String	Determines the visibility of this conference. This parameter corresponds to the "Visibility" setting on the web UI. Either true (private), false (public), or default.
streaming	String	Specifies the type of streaming to be used on the conference. One of: none unicast multicast unicastAndMulticast default.
conferenceMeEnabled	String	Whether or not ConferenceMe is enabled for conferences that use this template. One of: true: ConferenceMe enabled false: ConferenceMe disabled default: Inherit the parent's setting
contentMode	String	One of: disabled: no content in this conference transcoded: incoming content is always decoded and then re-encoded.
h239Enabled	String	Deprecated in favor of <code>contentMode</code> . If you set the deprecated <code>h239Enabled</code> parameter to <code>true</code> , <code>contentMode</code> will be set to <code>transcoded</code> . If you set <code>h239Enabled</code> to <code>false</code> , <code>contentMode</code> will be set to <code>disabled</code> .
contentContribution	String	Whether, by default, endpoints are permitted to contribute the content channel for a conference through the mechanism of opening a content video channel. Equivalent to content contribution from endpoints on the web interface. Either: true: Content contribution is enabled. false: Content contribution is disabled default.

Parameter	Type	Comments
contentTransmitResolutions	String	<p>The resolution for the content channel that will be transmitted to endpoints in this conference. Equivalent to transmitted content resolutions on the web interface. One of:</p> <p>4to3only: The MCU will encode the content and transmit it in a resolution of ratio 4:3 16to9only: The MCU will encode the content and transmit it in a resolution of ratio 16:9. allowAll: The MCU will decide on the most optimal resolution depending on information about capabilities sent by the endpoints in the conference. default</p> <p>For ad hoc conferences, transmitted content resolution is controlled by the ad hoc conference template.</p>
contentTxCodec	String	<p>The codec used for transmitting content. One of:</p> <p>default: The template will use its parent's setting for this parameter. h263+ h264</p>
contentTxMinimumBitRate	String	<p>The minimum bit rate to use for transmitting content, in bps. One of:</p> <p>default: The template will use its parent's setting for this parameter or a bitrate of: 0,64000,128000,192000,256000,320000,384000,512000,768000,1000000,1250000,1500000</p>
joinAudioMuted	String	<p>Participant joins the conference without audio. One of:</p> <p>true: Audio is muted on joining the conference. false: Audio is not muted on joining the conference default.</p>
joinVideoMuted	String	<p>Participant joins the conference without video. One of:</p> <p>true: Video is disabled on joining the conference. false: Video is enabled on joining the conference default.</p>

Parameter	Type	Comments
layoutControlEx	String	<p>Prevents or permits conference participants changing their view layout or focused participant using Far-end Camera Control (FECC) or DTMF tones. Equivalent to Layout control via FECC / DTMF on the web interface. One of:</p> <ul style="list-style-type: none"> ▶ disabled: In this conference, participants will not be allowed to change their view layout using either FECC or DTMF, unless you have overridden this setting in an endpoint's individual configuration. ▶ default: The template will inherit the layoutControlEx setting from its parent. ▶ feccOnly: In this conference, participants will be only be allowed to change their view layout using FECC, unless you have overridden this setting in an endpoint's individual configuration. ▶ dtmfOnly: In this conference, participants will be only be allowed to change their view layout using DTMF, unless you have overridden this setting in an endpoint's individual configuration. ▶ feccWithDtmfFallback: In this conference, participants will be allowed to change their view layout using FECC. If FECC is not available, this participant will be able to use DTMF ▶ bothFeccAndDtmf: Participants will be allowed to change their layout setting with FECC and DTMF.
cameraControl	String	<p>Defines how the camera can be controlled. Accepts the same values as layoutControlEx.</p> <ul style="list-style-type: none"> ▶ default: The template will inherit the cameraControl setting from its parent template. You cannot set cameraControl to default on the top-level template.
dtmfMuteControl	String	<p>Controls whether the user can mute audio using *6. Either:</p> <p>true: participant can mute audio using *6 false: participant cannot mute audio using *6 default.</p>
encryptionRequired	String	<p>The encryption setting for this conference, if you have the encryption feature key enabled. Equivalent to the setting "Encryption" on the web interface. One of:</p> <p>true: Encryption required. false: Encryption optional default</p>

Parameter	Type	Comments
suppressDtmfEx	String	Controls the muting of DTMF tones. One of: fecc: DTMF tones are muted when DTMF is being used to control layout but far end camera control (FECC) is not available always: DTMF tones are always muted never: DTMF tones are never muted default The value "fecc" is equivalent to "When used for MCU control" on the web interface setting.
automaticLectureModeEnabled	String	Automatic lecture mode gives shows the speaker full screen. Equivalent to automatic lecture mode on the web interface. Either: true: automatic lecture enabled. false: automatic lecture mode disabled. default If automatic lecture mode is enabled, the automaticLectureModeTimeout parameter is required.
automaticLectureModeTimeout	Integer	Length of time in seconds that a speaker must be talking for them to appear in full screen mode. The parameter has a range of 0 to 60 seconds. A setting of 0 seconds will cause a new speaker to appear in full screen immediately.
chairControl	String	The chair control setting for the conference. This can be: none floorControlOnly chairAndFloorControl default These values correspond to the web interface "Floor and chair control" setting values of "Do not allow floor or chair control", "Allow floor control only" and "Allow floor and chair control" respectively. If not specified, the chair control setting for the new conference will be "Allow floor control only".
lastChairmanLeavesDisconnect	String	Corresponds to the "When only guests remain" conference setting in the web UI. Set <code>true</code> to disconnect all participants after the last chairman leaves the conference, or set <code>false</code> to take no action. Set to <code>default</code> to inherit this setting from the template's parent.

Parameter	Type	Comments
preconfiguredParticipantsDefer	String	Corresponds to the “Invite pre-configured participants” conference setting in the web UI. Set <code>true</code> to invite preconfigured participants when at least one other participant is present, or set <code>false</code> to invite them at the start of the conference. Set to <code>default</code> to inherit this setting from the template’s parent.
useMaximumPortsFromParent	Boolean	Cannot be set to true for template 0
enforceMaximumVideoPorts	Boolean	Has no effect if the request sets <code>usePortsFromParent</code> to true. Same as <code>conference.modify</code> .
maximumVideoPorts	Integer	Has no effect if the request sets <code>usePortsFromParent</code> to true. Same as <code>conference.modify</code> .
maximumAudioPorts	Integer	Has no effect if the request sets <code>usePortsFromParent</code> to true. Same as <code>conference.modify</code> .
enforceMaximumAudioPorts	Boolean	Has no effect if the request sets <code>usePortsFromParent</code> to true. Same as <code>conference.modify</code> .
useReservedPortsFromParent	Boolean	Cannot be set to true for template 0
reserveVideoPorts	Boolean	Has no effect if the request sets <code>usePortsFromParent</code> to true. Determines if the template should have a value for the reserved video ports setting.
reservedVideoPorts	Integer	Has no effect if the request sets <code>usePortsFromParent</code> to true. Same as <code>conference.modify</code> .
reserveAudioPorts	Boolean	Has no effect if the request sets <code>usePortsFromParent</code> to true. Determines if the template should have a value for the reserved audio ports setting.
reservedAudioPorts	Integer	Has no effect if the request sets <code>usePortsFromParent</code> to true. Same as <code>conference.modify</code> .

template.status

The `template.status` call returns a structure containing all the settings (see `template.modify`) for the selected template.

Parameter	Type	Comments
templateNumber	String	Selects the required template to query the status. Use 0 to retrieve the status of the top level template, or higher numbers for stored templates.

template.enumerate

The `template.enumerate` function returns an array of the template status structures showing the settings of all templates (see `template.modify`). The call does not take any parameters.

Deprecated calls

The calls listed below were supported in software version 1.0 of the MCU 4200 Series Management API but have since been superseded.

API call	Superseded by
conference.participant.add	participant.add
conference.participant.modify	participant.modify
conference.participant.remove	participant.remove
conference.query	conference.enumerate participant.enumerate
participant.enumerate	While this call is not itself deprecated, there is deprecated behaviour if there is no operationScope parameter. See the description on page 99 for details.
system.query	conference.enumerate device.query

participant.enumerate

While this call is not itself deprecated, there is deprecated behaviour if there is no operationScope parameter. In this case, provided that there are participants to return, the MCU will return a participant structure with the following members:

Response	Type	Comments
participantName	String	Participant identification as described above
participantProtocol	String	
participantType	String	
conferenceName	String	
autoAttendantUniqueld	String	
address	String	The address used to connect to the remote endpoint in question. Only returned when the address is known, or if the participant is configured via the API (which requires the address to be specified when added).
gatewayAddress	String	
deferConnection	Boolean	
displayName	String (< 32 characters)	The name used by the endpoint to identify itself. This may be different to the participantName. Only available after the participant has connected.
displayNameOverrideStatus	Boolean	Indicates whether the displayName value is the result of being overridden.
maxBitRateToMCU	Integer	As for “participant.add”; in kbps.
maxBitRateFromMCU	Integer	
callState	String	One of: dormant, alerting, connecting, connected or disconnected.
connectTime	dateTime.iso8601	Only returned after the participant is connected. This value is always present if the call state is connected; it may or may not be defined for participants in the disconnected call state, depending on whether they were ever connected.
disconnectTime	dateTime.iso8601	Only returned after the participant has disconnected.
disconnectReason	String	Only returned after the participant has disconnected. See <i>Participant disconnect reasons</i> on page 106.

Response	Type	Comments
connectPending	Boolean	TRUE if a "participant.connect" command is required for this participant. This parameter will cause either the initial connection to that endpoint (in the event that it was configured with deferConnection set) or a re-connection to that endpoint (in the event that it has disconnected).
audioRxCodec	String	
audioRxLost	Integer	
audioRxReceived	Integer	
audioTxCodec	String	
audioTxReportedLost	Integer	
audioTxSent	Integer	
audioRxMuted	Boolean	
audioRxGainMode	String	
audioRxGainMillidB	Integer	
videoRxCodec	String	
videoRxLost	Integer	
videoRxReceived	Integer	
videoTxCodec	String	
videoTxReportedLost	Integer	
videoTxSent	Integer	
videoRxMuted	Boolean	
videoTxWidescreen	Boolean	
important	Boolean	
activeSpeaker	Boolean	true if this participant is currently the active speaker in the conference.
layoutControlEnabled	Boolean	

Response	Type	Comments
cpLayout	String	The configured layout behavior for this participant. See the <i>Conference layouts</i> section on page 109. This parameter will be present only for participants configured via the API.
currentLayout	Integer	Actual layout in use for the video stream being sent by the MCU to this participant. This parameter will not be present if the participant is in an auto attendant rather than a conference, nor if the MCU is not currently transmitting video to the participant in question. The values for this are those described in the <i>Conference layouts</i> section on page 109.
callDirection	String	Either incoming or outgoing.

Related information sources

system.xml

While not strictly part of the XML-RPC API, some information can be retrieved from the system.xml file. This can be downloaded via HTTP as the file system.xml in the root of the unit, for example, <http://TestMCU/system.xml>.

The fields included in the system.xml file depend on whether the file is from a master or slave MCU. This is indicated in the table below. An example system.xml file is as follows:

```
<system>
  <manufacturer>Cisco</manufacturer>
  <model>MCU 4210</model>
  <serial>MRV1001SM0004B8</serial>
  <softwareVersion>1.4(1.2)</softwareVersion>
  <buildVersion>6.6(1.2)</buildVersion>
  <hostName>TestMCU</hostName>
  <totalVideoPorts>20</totalVideoPorts>
  <totalAudioOnlyPorts>20</totalAudioOnlyPorts>
  <totalStreamingAndContentPorts>20</totalStreamingAndContentPorts>
  <videoPortAllocation>
    <sd>40</sd>
  </videoPortAllocation>
  <portReservationMode>disabled</portReservationMode>
  <maxVideoResolution>cif</maxVideoResolution>
  <uptimeSeconds>2345</uptimeSeconds>
  <clusterType>master</clusterType>
</system>
```

The fields in the file are described in the table below.

Field	Comments
manufacturer	The manufacturer of this MCU..
model	The model of this particular MCU, e.g. MCU 4210.
serial	The serial number of this MCU.
softwareVersion	The software version currently running.
buildVersion	The build version of the software currently running.
hostName	The host name of the system.
totalVideoPorts	The total number of video ports on the MCU. In an MCU cluster, a slave returns a value of 0.
totalAudioOnlyPorts	The total number of audio only ports on the MCU. In an MCU cluster, a slave returns a value of 0.
totalStreamingAndContentPorts	The total number of ports allocated for streaming content. This value is only returned if it is non-zero.

Field	Comments
videoPortAllocation	The number of ports allocated to the selected video resolution. This field has the subfields <sd>, <hd>, <hdPlus>, and <fullhd>. Not returned on cluster slaves.
portReservationMode	"enabled" or "disabled", depending on the Media Port Reservation configuration setting. Master only.
maxVideoResolution	The maximum video resolution for the MCU; either "cif" or "max" if larger video is enabled. Master only.
uptimeSeconds	The number of seconds since the MCU was booted.
clusterType	The type of MCU if part of a cluster. Either "master", "slave", or "not set".

Fault codes

The MCU has 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.

Fault Code	Description
1	Call not supported. This call is not supported on this MCU.
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 MCU 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	Authorization failed. This code may be returned for a failed login attempt, in which case the supplied username or password, or both, may be incorrect.
15	Insufficient privileges. The supplied user id and password combination is correct but the user is not allowed to perform the attempted operation.
16	Invalid enumerateID value. An enumerate ID passed to an enumerate call invocation was invalid. Only values returned by the MCU should be used in enumerate calls.
17	Port reservation failure. This is in the case that reservedAudioPorts or reservedVideoPorts value is set too high, and the MCU cannot support this.

Fault Code	Description
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 call. 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 MCU.
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.
27	No such template. Returned when a call asks for a template that the MCU does not recognize.
31	Template name in use. This fault occurs when the call tries to create a template, or rename a template, with the same name as an existing template.
32	Too many templates. This fault occurs when the call tries to create a new template when the MCU already has the maximum number of templates (100).
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.

Participant disconnect reasons

These are the possible values of the “disconnectReason” field in participant information responses:

Value	Description
authenticationFailed	VNC authentication failed. Check username and password
Busy	The endpoint is in another call
capabilityNegotiationError	Unable to negotiate a common capability set between endpoint and MCU. For example there is no video codec that both sides support
destinationUnreachable	The destination endpoint could not be reached or did not respond
disconnectAll	The MCU disconnected all calls. This occurs at the end of a scheduled conference or a user initiates a disconnect all from the web interface
dnsFailed	A DNS lookup has failed. This can occur when dialling by DNS name
failedToConnectToServer	Unable to connect to VNC server. This can be due to a network problem or if a VNC server is not listening on the specified host
gatekeeperEnded	The gatekeeper ended the call
gatekeeperError	The gatekeeper refused to let the call complete or did not respond
gatekeeperForced	The gatekeeper forced the call to disconnect. For example the end call option was selected on the gatekeeper
gatekeeperRequiredButAbsent	No gatekeeper has been configured but MCU settings require that one be present
h225DecodeError	Error decoding incoming H.225 message. For example the MCU was unable to decode the incoming H.225 message
h225ProtocolError	There has been a H.225 protocol error. For example the endpoint has sent an invalid H.255 message to the MCU
h225SocketError	There has been a error establishing a TCP connection to the H.225 socket on the endpoint. For example there is no route to the desired IP address
h245DecodeError	Error decoding incoming H.245 message. For example the MCU was unable to decode the incoming H.245 message
h245ProtocolError	There has been a H.225 protocol error. For example the endpoint has sent an invalid H.255 message to the MCU

Value	Description
h245SocketError	There has been a error establishing a TCP connection to the H.245 socket on the endpoint. For example the endpoint is not listening on the H.245 port it had previously specified
incompatibleVncVersion	VNC version is incompatible with MCU. Check knowledge base for details of supported versions
localGatekeeperRefused	The local gatekeeper refused the call. This maybe because the destination is not registered to the gatekeeper, for example when dialling direct by IP address
localTeardown	The MCU disconnected the call
messageQueueOverflow	An excess of information in the message buffer has caused it to run out of space and overflow
Moved	The endpoint has moved to a different conference
networkError	There has been an unspecified network error
noAnswer	The endpoint started ringing but the call was not accepted by the user
noGatekeeperForDN	No gatekeeper has been found for dialed number. This can occur when attempting a call to an invalid E164 number
portAllocationExceeded	The number of available ports (both audio and video) on the MCU has been exceeded
protocolError	There has been an unspecified protocol error
q931DecodeError	Error decoding incoming Q.931 message. For example the MCU was unable to decode the incoming Q.931 message
q931ProtocolError	There has been a Q.931 protocol error. For example the endpoint has sent an invalid Q.931 message to the MCU
Rejected	The endpoint chose to reject an incoming call instead of answering
rejectedImmediately	The endpoint rejected the call without ringing
remoteGatekeeperRefused	The remote gatekeeper refused the call. This maybe because the MCU is not registered to the the gatekeeper required by the endpoint
remoteGatekeeperUnreachable	The remote gatekeeper did not respond to the endpoint that the MCU was trying to call
remoteGatewayResources	The remote gateway has insufficient resources to let the call complete. For example the call is being routed to an ISDN gateway with insufficient channels to allow the call to complete

Value	Description
remoteTeardown	The endpoint disconnected the call
serviceUnavailable	The requested service is unavailable. This directly corresponds to an H.323 or SIP message received from the far end to indicate that the call is unable to proceed. The far end could have made this decision for any one of a number of reasons, including lack of resource availability or a call routing policy that prevents the MCU from calling the destination number
Timeout	Could not establish call due to network timeout
Unspecified	This is a "catch all" reason used when no extra information can be provided
unspecifiedError	This is a "catch all" reason used when no extra information can be provided
videoPortAllocationExceeded	The number of available video ports on the MCU has been exceeded

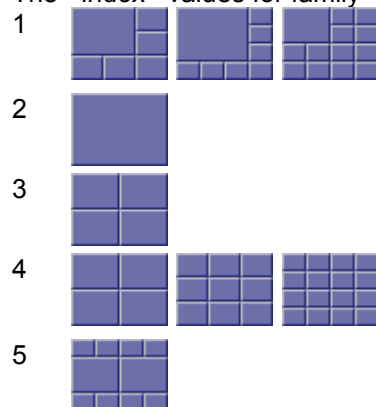
Conference layouts

Some API calls allow a particular layout to be specified for video sent to that participant via the `cpLayout`, `currentLayout`, `customLayout` parameters. These parameter can take the following values:

- ▶ **default** - use the MCU's default view family
- ▶ **family<index>** - use the specified layout family (see below)
- ▶ **layout<index>** - use a specific layout (see below)
- ▶ **conferenceCustom** - use the conference custom layout

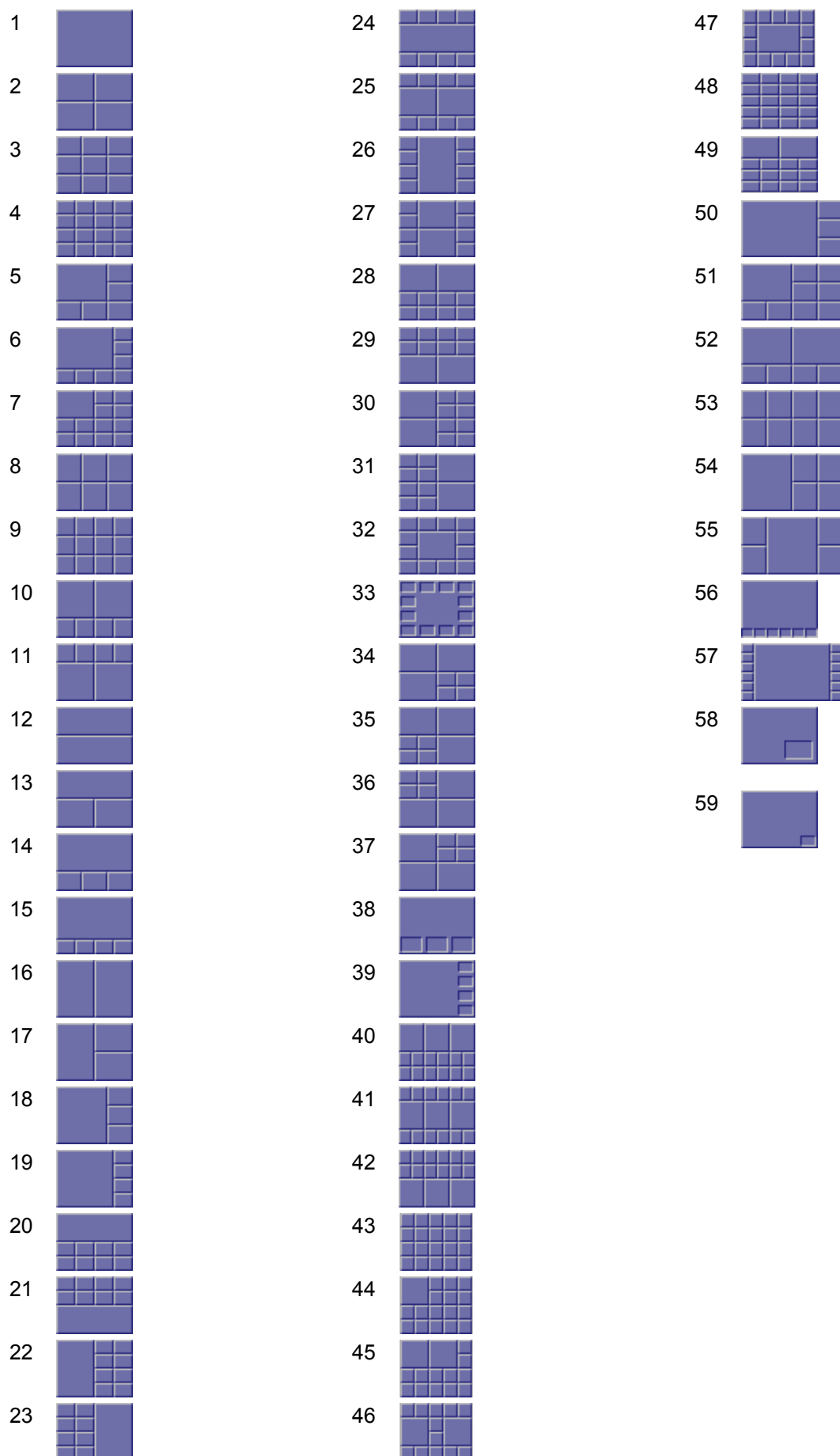
Family layouts

The `<index>` values for `family<index>` correspond to the pane arrangements shown below.



Specific layouts

The `<index>` values for `layout<index>` correspond to the pane arrangements shown in the pages following



Linking conferences across MCUs

For the purposes of this description, two conferences are said to be "linked" if there is a bi-directional H.323 connection between them and each MCU is sending a video channel to the other, showing the active speaker full screen. The audio communicated between the MCUs will be the usual mix of active speakers. For clarification, the linked conferences are given different names ("linked1" and "linked2") in the explanation, but they can have the same name.

The first step is to set up the two conferences. It is important to ensure that the conferences have a numeric id set (the "conferenceId" field in "conference.create"), because, without this configured field, it is not possible to call in directly to a conference. In this example both conferences are given a numeric id, though strictly it is only necessary on the *target* MCU (i.e. the one that is called rather than the one calling).

In this specific example, "linked1" is set up on "mcu1" and "linked2" set up on "mcu2". The creation of "linked1" is shown in **example message 1**, and it is configured with numeric id "1234"; the creation of "linked2" is shown in **example message 2**, and this conference is given the numeric id "5678".

Next, a participant needs to be added to the "linked1" conference and connected to "linked2" on the target MCU. The most reliable way to accomplish this, which does not rely on the target MCU's gatekeeper usage, is to call from "mcu1" into the target conference using "mcu2" as a gateway and the target conference's numeric id as the remote address. The participant addition is shown in **example message 3** - as well as the address and gateway. It also configures the view layout to be full screen (by setting "cpLayout" to "layout1") to make sure that just the active speaker from "linked1" is sent to "linked2".

The final step is slightly more complex — it involves modifying the new "linked2" participant on "mcu2" which was the result of the call from "mcu1". The modification required is to change the view layout setting (for the video sent from "linked2" to "linked1") to full screen so that a view of the "linked2" active speaker is sent.

The complication here is that the "linked2" participant in question is not a participant created via the API, and so the API does not know the name in advance. Therefore, it is necessary to:

- ▶ poll membership of "linked2" after the connection from "linked1" has been made
- ▶ identify the participant corresponding to the call
- ▶ use its name in a "participant.modify" call to set the view layout

The simplest way to identify the participant is to look for an absence of the "address" field in a "conference.query" response: for incoming, non-API, connections this will not be present. **Example message 4** shows such a "participant.modify" call; in this case the participant name needed was "1_Cisco MCU 4210".

Example message 1 - creating conference "linked1" on "mcu1"

```
<?xml version="1.0"?>
<methodCall>
  <methodName>conference.create</methodName>
  <params>
    <param>
      <value>
        <struct>
          <member>
            <name>authenticationUser</name>
            <value>
              <string>admin</string>
            </value>
          </member>
          <member>
            <name>conferenceName</name>
            <value>
              <string>linked1</string>
            </value>
          </member>
          <member>
            <name>conferenceID</name>
            <value>
              <string>1234</string>
            </value>
          </member>
        </struct>
      </value>
    </param>
  </params>
</methodCall>
```

Example message 2 - creating conference "linked2" on "mcu2"

```
<?xml version="1.0"?>
<methodCall>
  <methodName>conference.create</methodName>
  <params>
    <param>
      <value>
        <struct>
          <member>
            <name>authenticationUser</name>
            <value>
              <string>admin</string>
            </value>
          </member>
          <member>
            <name>conferenceName</name>
            <value>
              <string>linked2</string>
            </value>
          </member>
          <member>
            <name>conferenceID</name>
            <value>
              <string>5678</string>
            </value>
          </member>
        </struct>
      </value>
    </param>
  </params>
</methodCall>
```


Example message 3 - calling into "linked2" from "linked1"

```
<?xml version="1.0"?>
<methodCall>
  <methodName>participant.add</methodName>
  <params>
    <param>
      <value>
        <struct>
          <member>
            <name>authenticationUser</name>
            <value>
              <string>admin</string>
            </value>
          </member>
          <member>
            <name>conferenceName</name>
            <value>
              <string>linked1</string>
            </value>
          </member>
          <member>
            <name>participantName</name>
            <value>
              <string>remote_mcu</string>
            </value>
          </member>
          <member>
            <name>address</name>
            <value>
              <string>5678</string>
            </value>
          </member>
          <member>
            <name>gatewayAddress</name>
            <value>
              <string>10.2.1.27</string>
            </value>
          </member>
          <member>
            <name>cpLayout</name>
            <value>
              <string>layout1</string>
            </value>
          </member>
        </struct>
      </value>
    </param>
  </params>
</methodCall>
```

Example message 4 - setting the new "linked2" participant to use a full screen view layout

```
<?xml version="1.0"?>
<methodCall>
  <methodName>participant.modify</methodName>
  <params>
    <param>
      <value>
        <struct>
          <member>
            <name>authenticationUser</name>
            <value>
              <string>admin</string>
            </value>
          </member>
          <member>
            <name>conferenceName</name>
            <value>
```

```
        <string>linked2</string>
      </value>
    </member>
    <member>
      <name>participantName</name>
      <value>
        <string>1_Cisco MCU 4210</string>
      </value>
    </member>
    <member>
      <name>operationScope</name>
      <value>
        <string>active</string>
      </value>
    </member>
    <member>
      <name>cpLayout</name>
      <value>
        <string>layout1</string>
      </value>
    </member>
  </struct>
</value>
</param>
</params>
</methodCall>
```

Message responses

The response to each of the above method invocations should be the same normal success indication:

```
<?xml version="1.0"?>
<methodResponse>
  <params>
    <param>
      <value>
        <struct>
          <member>
            <name>status</name>
            <value>
              <string>operation successful</string>
            </value>
          </member>
        </struct>
      </value>
    </param>
  </params>
</methodResponse>
```

Revision numbers

Note: This feature is available from API version 2.4 onwards. An application can determine the API version supported by an MCU from the *apiVersion* value returned in the response to a *device.query* request.

In order to reduce the size of responses when querying the MCU, the following methods support a “revision number” system:

- ▶ participant.enumerate
- ▶ conference.enumerate
- ▶ autoAttendant.enumerate

When the MCU responds to a call that supports revision numbers, it returns an extra integer field called “currentRevision”. The following is an example of such a field:

```
<member>
<name>currentRevision</name>
<value>
<int>18</int>
</value>
</member>
```

The revision number is a monotonically increasing value that increases every time any query is made on the MCU via the API. In order to reduce the size of subsequent query responses, the parameter “lastRevision” may be passed in as part of a request; for example:

```
<member>
<name>lastRevision</name>
<value>
<int>18</int>
</value>
</member>
```

This indicates to the MCU that only records that have changed since this revision number should be returned. For example, in *participant.enumerate*, if a *lastRevision* parameter is provided, then the enumeration response will only include participants that have changed since this revision.

Note that when using revision numbers with *enumerate* methods, the same *lastRevision* parameter should be used for each stage of the enumeration, even though a greater *currentRevision* parameter will be returned at each stage. Not doing so could result in records which have changed not being returned. Likewise having completed an enumeration, the only *currentRevision* parameter which should be stored is the one that was returned with the first stage of the enumeration. This is the revision number that should be used as the *lastRevision* parameter next time an enumeration cycle is started.

Using the same revision numbers throughout enumerations is necessary to ensure that all records that have changed are reported, but it does mean that a record may be reported more than once occasionally when there has only been one change to it.

Discovering record removal

The problem with only returning records in responses when they have changed is that if a record is removed there is no way for the client to distinguish between it being removed and just not having changed.

There are two solutions to this problem; the first is the `listAll` parameter and the second is described in the next section. A client may periodically include the `listAll` Boolean parameter set to `TRUE` to indicate that the MCU should return every record available. Enumeration limits still apply so multiple calls using the standard enumeration protocol may be required. This allows a client to resynchronize to the MCU, because it can safely assume that any record not returned by this request (or series of requests, in the case of enumerations) is no longer a record on the MCU.

For example, any participants not returned by `participant.enumerate` when `listAll` is set to `true` can be assumed to have been removed from the MCU.

The `listAll` parameter can still be used in conjunction with the `lastRevision` parameter: doing so means that every record will be returned, but records that have not changed since the specified revision may have many members removed from their substructures. Substructures that have had members removed in this way will contain a field named “`changed`” instead, which will be set to `false` indicating that there are no changes to the data in this substructure since the specified revision number.

Dead records

The second approach to the record removal problem is the `dead` parameter. The MCU will maintain a cache of records that have been removed and are in no sense considered active; a “dead” record will never be returned if revision numbers are not being used or if the `listAll` parameter is set to `true` (e.g. a previous participant record is still not considered a dead record because it would be returned by a normal `participant.enumerate` request).

A dead record will be returned by a call supporting revision numbers if the `lastRevision` parameter designates a revision at which the record was not yet dead. The returned record will contain only the fields necessary for its identification and an extra field “`dead`”, which will be set to `true` to indicate that this record should no longer be considered to be present on the MCU.

These dead records are only cached on the MCU for a few minutes; therefore a client should not rely on them unless it is doing very regular polling. When using less frequent polling using the `listAll` parameter described above is more appropriate.

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 MCU via the API is to use HTTP keep-alives. This method can be used with other products that also support the API, such as the Cisco TelePresence VCR and ISDN Gateway.

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

```
Connection: close
```

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

The MCU 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](#).

Title	Link
XML-RPC	http://www.xmlrpc.com/
Hypertext Transfer Protocol (HTTP/1.1)	http://www.faqs.org/rfcs/rfc2616.html

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