Configuring Video Support

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This chapter describes the video support in Cisco Unified Communications Manager Express (Cisco Unified CME).

Finding Feature Information in This Module

Your Cisco Unified CME version may not support all of the features documented in this module. For a list of the versions in which each feature is supported, see the "Feature Information for Video Support" section on page 1420.

Contents

Prerequisites for Video Support

- H.323 or SIP network for voice calls is operational.
- Cisco Unified CME 4.0 or a later version.
- Cisco Unified IP phones are registered in Cisco Unified CME.
- Connection between Cisco Unified Video Advantage (CUVA) 1.02 or a later version and the Cisco Unified IP phone is up. From a PC with CUVA 1.02 or a later version installed, ensure that the line between the CUVA and the Cisco Unified IP phone is green. For more information, see *Cisco Unified Video Advantage User Guide.*

- Correct video firmware is installed on the Cisco Unified IP phone.
  - For Cisco Unified IP Phone 7940G and 7960G, 6.0(4) or a later version.
  - Cisco Unified IP Phone 7970G, 7.0(3) or a later version.
  - Cisco Unified IP Phone 7941G and7961G, 7.0(3) or a later version.

Note Other video-enabled endpoints registered with a Cisco Unified Communications Manager (Cisco Unified CM) can place video calls to Cisco Unified IP phones only if the phones are registered with a Cisco Unified CME and the appropriate video firmware is installed on the Cisco Unified IP phone.

Restrictions for Video Support

- This feature supports only the following video codecs:
  - H.261—Cisco Unified CME 4.0 and later versions
  - H.263—Cisco Unified CME 4.0 and later versions
  - H.264—Cisco Unified CME 7.1 and later versions
- This feature supports only the following video formats:
  - 4CIF—Resolution 704x576
  - 16CIF—Resolution 1408x1152
  - Common Intermediate Format (CIF)—Resolution 352x288
  - One-Quarter Common Intermediate Format (QCIF)—Resolution 176x144
  - Sub QIF (SQCIF)—Resolution 128x96
- The call start fast feature is not supported with an H.323 video connection. You must configure call start slow for H.323 video. For configuration information, see the "SCCP: Enabling Support for Video Streams Across H.323 Networks" section on page 1413.
- Video capabilities are configured per phone, not per line.
- All call feature controls (for example, mute and hold) apply to both audio and video calls, if applicable.
- This feature does not support the following:
  - Dynamic addition of video capability—The video capability must be present *before* the call setup starts to allow the video connection.
  - T-120 data connection between two SCCP endpoints.
  - Video security.
  - Far-end camera control (FECC) for SCCP endpoints.
  - Video codec renegotiation—The negotiated video codec must match or the call falls back to audio-only. The negotiated codec for the existing call can be used for a new call.
  - SIP endpoints— When a video-capable SCCP endpoint connects to a SIP endpoint, the call falls back to audio-only (prior to Cisco Unified CME 8.6).
  - Video supplementary services between Cisco Unified CME and Cisco Unified CM.

- If the Cisco Unified CM is configured for Media Termination Point (MTP) transcoding, a video call between Cisco Unified CME and Cisco Unified CM is not supported.
- Video telephony is not supported with Cisco Unified CME MTP and codec g729/dspfarm-assist configuration under ephone.
- If an SCCP endpoint calls an SCCP endpoint on the local Cisco Unified CME and one of the endpoints transferred across an H.323 network, a video-consult transfer between the Cisco Unified CME systems is not supported.
- When a video-capable endpoint connects to an audio-only endpoint, the call falls back to audio-only. During audio-only calls, video messages are skipped.
- For Cisco Unified CME, the video capabilities in the vendor configuration firmware is a global configuration. This means that, although video can be enabled per ephone, the video icon shows on all Cisco Unified IP phones supported by Cisco Unified CME.
- Because of the extra CPU consumption on RTP-stream mixing, the number of video calls supported on Cisco Unified CME crossing an H.323 network is less than the maximum number of ephones supported.
- Cisco Unified CME cannot differentiate audio-only streams and audio-in-video streams. You must configure the DSCP values of audio and video streams in the H.323 dial-peers.
- If RSVP is enabled on the Cisco Unified CME, a video call is not supported.
- A separate VoIP dial peer, configured for fast-connect procedures, is required to complete a video call from a remote H.323 network to a Cisco Unity Express system.

Information About Video Support

To configure video support for SCCP endpoints, you should understand the following concepts:

- Video Support Overview, page 1400
- SIP Trunk Video Support, page 1400
- Matching Endpoint Capabilities, page 1401
- Retrieving Video Codec Information, page 1401
- Call Fallback to Audio-Only, page 1401
- Call Setup for Video Endpoints, page 1402
- Flow of the RTP Video Stream, page 1404
- SIP Endpoint Video and Camera Support for Cisco Unified IP Phones 8961, 9951, and 9971, page 1403

Video Support Overview

Video support allows you to pass a video stream, with a voice call, between two video-capable SCCP endpoints and between SCCP and H.323 endpoints. Through the Cisco Unified CME router, the video-capable endpoints can communicate with each other locally to a remote H.323 endpoint through a gateway or through an H.323 network.

Video capabilities are disabled by default, and enabling video capabilities on Cisco Unified CME does not automatically enable video on all ephones. You must first enable video globally for all video-capable SCCP phones associated with a Cisco Unified CME router and then enable video for each phone individually. Video parameters, like maximum bit rate, are set at a system level.

For information about the global configuration for video capabilities, see the "SCCP: Enabling System-Level Video Capabilities" section on page 1414.

For information about configuring an individual phone for video capabilities, see the "SCCP: Enabling Video Capabilities on a Phone" section on page 1415.

Note After video is enabled globally, all video-capable ephones display the video icon.

SIP Trunk Video Support

Cisco Unified CME 7.1 adds the following support for video calls:

- Support for video calls between SCCP endpoints across different Cisco Unified CME routers connected through a SIP trunk. All previously supported SCCP video endpoints and video codecs are supported.
- H.264 video support—H.264 provides high-quality images at low bit rates and is widely used in commercial video conferencing systems. The H.264 codec supports the following video calls:
  - SCCP to SCCP
  - SCCP to SIP
  - SCCP to H.323
  - Dynamic payload negotiation for H.264 (both SCCP to SIP and SCCP to H323)
- SCCP to SIP video supplementary services for all supported video codecs, including H.264 codec. The supported services include call forward, blind transfer, and consultative transfer. End-to-end negotiation is supported between the endpoints.

Restrictions

- On Cisco Unified CME 8.6, calls made from SIP endpoints across a SIP trunk terminating on a non-CME endpoint (such as those controlled by a Cisco Unified CM or video conferencing MTU) require the following CLI to be configured to allow video:

```
voice service voip
 sip
   asymmetric payload full
```

- The **no supplementary-service sip moved-temporarily** and **no supplementary-service sip refer** commands are not supported for video calls through a SIP trunk.

No new configuration is required to support these enhancements. For configuration information, see the "How to Configure Video" section on page 1405.

Matching Endpoint Capabilities

During phone registration, information about endpoint capabilities is stored in the Cisco Unified CME. These capabilities are used to match with other endpoints during call setup. Endpoints can update at any time; however, the router recognizes endpoint-capability changes only during call setup. If a video feature is added to a phone, the information about it is updated in the router's internal data structure but that information does not become effective until the next call. If a video feature is removed, the router continues to see the video capability until the call is terminated but no video stream is exchanged between the two endpoints.

Note The endpoint-capability match is executed each time a new call is set up or an existing call is resumed.

Retrieving Video Codec Information

Voice gateways use dial-peer configurations to retrieve codec information for audio codecs. Video codec selection is done by the endpoints and is not controlled by the H.323 service-provider interface (SPI) through dial-peer or other configuration. The video-codec information is retrieved from the SCCP endpoint using a capabilities request during call setup.

Call Fallback to Audio-Only

When a video-capable endpoint connects to an audio-only endpoint, the call falls back to an audio-only connection. Also, for certain features such as conferencing, where video support is not available, the call falls back to audio-only.

Cisco Unified CME routers use a call-type flag to indicate whether the call is video-capable or audio-only. The call-type flag is set to video when the video capability is matched or set to audio-only when connecting to an audio-only TDM or an audio-only SIP endpoint.

Note During an audio-only connection, all video-related media messages are skipped.

Call Setup for Video Endpoints

The process for handling SCCP video endpoints is the same as that for handling SCCP audio endpoints. The video call must be part of the audio call. If the audio call setup fails, the video call fails.

During the call setup for video, media setup handling determines if a video-media-path is required. If so, the corresponding video-media-path setup actions are taken.

- For an SCCP endpoint, video-media-path setup includes sending messages to the endpoints to open a multimedia path and start the multimedia transmission.
- For an H.323 endpoint, video-media-path setup includes an exchange between the endpoints to open a logical channel for the video stream.

A call-type flag is set during call setup on the basis of the endpoint-capability match. After call setup, the call-type flag is used to determine whether an additional video media path is required. Call signaling is managed by the Cisco Unified CME router and the media stream is directly connected between the two video-enabled SCCP endpoints on the same router. Video-related commands and flow-control messages are forwarded to the other endpoint. Routers do not interpret these messages.

Call Setup Between Two Local SCCP Endpoints

For interoperation between two local SCCP endpoints on the same router, video call setup uses all existing audio-call-setup handling, except during media setup. During media setup, a message is sent to establish the video-media-path. If the endpoint responds, the video-media-path is established and a start-multimedia-transmission function is called.

Call Setup Between SCCP and H.323 Endpoints

Call setup between SCCP and H.323 endpoints is the same as it is between SCCP endpoints except that if video capability is selected, the event is posted to the H.323 call leg to send out a video open logical channel (OLC) and the gateway generates an OLC for the video channel. Because the router needs to both terminate and originate the media stream, video must be enabled on the router before call setup begins.

Call Setup Between Two SCCP Endpoints Across an H.323 Network

If call setup between SCCP endpoints occurs across an H.323 network, the setup is a combination of the processes listed in the previous two sections. The router controls the video media setup between the two endpoints and the event is posted to the H.323 call leg so that the gateway can generate an OLC.

Because the endpoint capability negotiation and match occur after the H.323 connect message, video streams over H.323 network require slow-start on call setup procedures for Cisco Unified CME. An H.323 network can connect to a remote Cisco Unified CME router, Cisco Unified CM, remote IP to IP gateway, or a video-capable H.323 endpoint. For configuration information, see the "SCCP: Enabling System-Level Video Capabilities" section on page 1414.

SIP Endpoint Video and Camera Support for Cisco Unified IP Phones 8961, 9951, and 9971

Cisco Unified CME 8.6 and later versions add phone-based video support and Universal Serial Bus (USB) camera support for Cisco Unified IP Phones 8961, 9951, and 9971. The Cisco Unified IP Phones 8961, 9951, and 9971 display local video using the USB camera. Cisco Unified IP Phones 9951 and 9971 with phone load 9.1.1 decode remote incoming video RTP streams and display the video on the phone's display screen. However, the video and USB camera capabilities of these two phones are disabled on Cisco Unified CME by default and are enabled by setting up the video and camera parameters in the phone provisioning file.

Cisco Unified CME 8.6 supports local SIP-video-to-SIP-video calls and SIP-video-to-SCCP-CUVA-video calls on Cisco Unified IP Phones 8961, 9951, and 9971 on the line side. On the trunk side, SIP video call is only supported with SIP trunk. H323 trunk is not supported for video calls on Cisco Unified IP Phones 9951 and 9971.

The media path for SIP video call is flow through and media flow-around is not supported for SIP line in Cisco Unified CME.

Video and Camera Configuration for Cisco Unified IP Phones

Cisco Unified CME uses the **video** and **camera** commands to allow video or camera to be enabled per phone, per template, or for global configuration. The **video** and **camera** commands are configured under the voice register pool, voice register template, and voice register global configuration modes. Once the commands are configured, the **create profile** command is required to have the phones provision file update with new configuration. For more information on enabling camera and video parameters on phones, see the "SIP: Enabling Video and Camera Support on Cisco Unified IP Phones 9951 and 9971" section on page 1405.

The changes in video and camera configuration are applied to the phones when Cisco Unified CME sends the request to a phone through a service-control event in a SIP NOTIFY message. In earlier versions of Cisco Unified CME, SIP phones were required to reset and restart to update the new configuration parameters.

In Cisco Unified CME 8.6 and later versions, you use the **apply-config** command under voice register pool and voice register global configuration modes to dynamically apply the video and camera configuration changes to the phone configuration of Cisco Unified IP Phones 8961, 9951, and 9971 without restarting or resetting the phones and without causing any service interruption.

When Cisco Unified IP Phones 8961, 9971 and 9951 receive the apply-config request, the phones retrieve the new configuration file from the TFTP server and compare it with the existing configuration. The phones may restart themselves if there are any changes that requires a restart; otherwise, the phones apply the changes dynamically without restarting.

For more information, see the "SIP: Applying Video and Camera Configuration to Cisco IP Phones 8961, 9951, and 9971" section on page 1410.

Bandwidth Control for SIP Video Calls

Video call bandwidth control is critical when there is a limit in resources. Typically, video calls require much higher bandwidth usage than audio-only calls. Video calls on Cisco Unified IP Phones 9951 and 9971 can use up to 1 Mbps for VGA quality video compared to 64 kbps plus overhead for a G711 audio call.

In Cisco Unified CME 8.6, the Cisco Unified SIP IP Phones 9951 and 9971 with VGA resolution offer 1-Mbps maximum bit-rate and answer with a lower value of received offer and 1 Mbps. Phones transmit video resolution and frame rate is set according to the maximum bandwidth bit-rate negotiated in the SIP offer or answer. Cisco Unified CME controls the SIP global bandwidth by configuring the **bandwidth video tias-modifier** *bandwidth value* **[negotiate** *end-to-end***]** command in voice register global configuration mode. The bandwidth control configuration is applied to the SIP phone dial-peer.

There are no new bandwidth changes in the SCCP CUVA side and the bandwidth configuration works the same as in earlier versions of Cisco Unified CME.

For more information on configuring bandwidth control, see the "SIP: Configuring Video Bandwidth Control for SIP to SIP Video Calls" section on page 1411.

Flow of the RTP Video Stream

For video streams between two local SCCP endpoints, the Real-Time Transport Protocol (RTP) stream is in flow-around mode. For video streams between SCCP and H.323 endpoints or two SCCP endpoints on different Cisco Unified CME routers, the RTP stream is in flow-through mode.

- Media flow-around mode enables RTP packets to stream directly between the endpoints of a VoIP call without the involvement of the gateway. By default, the gateway receives the incoming media, terminates the call, and then reoriginates it on the outbound call leg. In flow-around mode, only signaling data is passed to the gateway, improving scalability and performance.
- With flow-through mode, the video media path is the same as for an audio call. Media packets flow through the gateway, thus hiding the networks from each other.

Use the **show voip rtp connection** command to display information about RTP named-event packets, such as caller-ID number, IP address, and port for both the local and remote endpoints, as shown in the following sample output:

```
Router# show voip rtp connections

VoIP RTP active connections :
No. CallId  dstCallId  LocalRTP RmtRTP LocalIP         RemoteIP
1   102     103        18714    18158  10.1.1.1        192.168.1.1
2   105     104        17252    19088  10.1.1.1        192.168.1.1
Found 2 active RTP connections
============================
```

How to Configure Video

This section contains the following tasks:

- SIP: Enabling Video and Camera Support on Cisco Unified IP Phones 9951 and 9971, page 1405 (required)
- SIP: Applying Video and Camera Configuration to Cisco IP Phones 8961, 9951, and 9971, page 1410 (required)
- SIP: Configuring Video Bandwidth Control for SIP to SIP Video Calls, page 1411 (required)
- SCCP: Enabling Support for Video Streams Across H.323 Networks, page 1413 (required)
- SCCP: Enabling System-Level Video Capabilities, page 1414 (required)
- SCCP: Enabling Video Capabilities on a Phone, page 1415 (required)
- Verifying Video Support, page 1417 (optional)
- Troubleshooting Video Support, page 1417 (optional)

SIP: Enabling Video and Camera Support on Cisco Unified IP Phones 9951 and 9971

To enable video and camera support on Cisco Unified IP Phones 9951 and 9971, perform the following steps:

Prerequisites

- Cisco Unified CME 8.6 or a later version.
- The **mode cme** command is configured under voice register global configuration mode.

Restrictions

- Shared line is not supported.
- Video transfer and forward supplementary service is not supported when **no supplementary-service sip refer/move-temporary** is configured.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **voice register global**
4. **camera**
5. **video**
6. **create profile**
7. **exit**
8. **voice register pool** *pool tag*
9. **id** *mac address*
10. **camera**
11. **video**
12. **exit**
13. **voice register template** *template-tag*
14. **camera**
15. **video**
16. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**voice register global** **Example:** `Router(config)#voice register global`	Enters voice register global configuration mode to set parameters for all supported SIP phones in Cisco Unified CME.
Step 4	**camera** **Example:** `Router(config-register-global)#camera`	Enables the **camera** command under voice register global configuration mode.

	Command or Action	Purpose
Step 5	**video** **Example:** `Router(config-register-global)#video`	Enables the **video** command under voice register global configuration mode. **Note** Make sure you configure **video** command without configuring the **camera** command so that Cisco Unified IP phones 9951 and 9971 can switch from phone-based video camera to CUVA. If you configure both **video** and **camera** commands together, you may need to manually remove the USB camera from Cisco Unified IP phones 9951 and 9971.
Step 6	**create profile** **Example:** `Router(config-register-global)# create profile`	Generates provisioning files required for SIP phones and writes the file to the location specified with the **tftp-path** command.
Step 7	**exit** **Example:** `Router(config-register-global)#exit`	Exits voice register global configuration mode.
Step 8	**voice register pool** *pool tag* **Example:** `Router(config)#voice register pool 5`	Enters voice register pool configuration mode to set phone-specific parameters for a SIP phone.
Step 9	**id mac** *address* **Example:** `Router(config-register-pool)#id mac 0009.A3D4.1234`	Explicitly identifies a locally available individual SIP phone to support a degree of authentication.
Step 10	**camera** **Example:** `Router(config-register-pool)#camera`	Enables the **camera** command under voice register pool configuration mode.
Step 11	**video** **Example:** `Router(config-register-pool)#video`	Enables the **video** command under voice register pool configuration mode.
Step 12	**exit** **Example:** `Router(config-register-pool)#exit`	Exits voice register pool configuration mode.
Step 13	**voice register template** *template-tag* **Example:** `Router(config)voice register template 10`	Enters voice register template configuration mode to define a template of common parameters for SIP phones in Cisco Unified CME. • Range: 1 to 5.

	Command or Action	Purpose
Step 14	**camera** **Example:** `Router(config-register-template)#camera`	Configures the **camera** command under voice register template configuration mode.
Step 15	**video** **Example:** `Router(config-register-template)#video`	Configures the **video** command under voice register template configuration mode.
Step 16	**end** **Example:** `Router(config-register-template)# end`	Returns to privileged EXEC mode.

Examples

The following example shows the **camera** and **video** commands configured in voice register global configuration mode:

```
Router#show run
!
!
!
voice service voip
 allow-connections sip to sip
 fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0 fallback none
!
!
voice register global
 mode cme
 bandwidth video tias-modifier 512000 negotiate end-to-end
 max-pool 10
 camera
 video
!
voice register template  10
!
!
```

The following example shows the **video** and **camera** commands configured under voice register pool 5. You can also configure both **camera** and **video** commands under voice register template configuration mode.

```
Router#show run
!
!
voice service voip
 allow-connections sip to sip
 fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0 fallback none
!
!
voice register global
 mode cme
 bandwidth video tias-modifier 512000 negotiate end-to-end
 max-pool 10

!
voice register pool  1
 id mac 1111.1111.1111
!
voice register pool  4
!
voice register pool  5
 logout-profile 58
 id mac 0009.A3D4.1234
 camera
 video
!
```

What to Do Next

To apply the video and camera configuration to your Cisco Unified SIP IP phones 8961, 9951, and 9971, see the "SIP: Applying Video and Camera Configuration to Cisco IP Phones 8961, 9951, and 9971" section on page 1410.

SIP: Applying Video and Camera Configuration to Cisco IP Phones 8961, 9951, and 9971

Apply-config is similar to resetting or restarting the phones and allowing the phones to update phone configuration files. Phones only reboot if needed. To apply video configuration to Cisco Unified IP phones 8961, 9951, and 9971, perform the following steps:

Prerequisites

Cisco Unified CME 8.6 or a later version.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **voice register global**
4. **apply-config**
5. **exit**
6. **voice register pool** *pool tag*
7. **apply-config**
8. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**voice register global** **Example:** `Router(config)#voice register global`	Enters voice register global configuration mode to set parameters for all supported SIP phones in Cisco Unified CME.
Step 4	**apply-config** **Example:** `Router(config-register-global)#apply-config`	Applies configuration for the Cisco Unified SIP IP phones 8961, 9951, and 9971 and restarts all other SIP phones. The **apply-config** command acts as a reset if configured on any other phone type.
Step 5	**exit** **Example:** `Router(cfg-translation-rule)# exit`	Exits voice register global configuration mode.

	Command or Action	Purpose
Step 6	**voice register pool** *pool tag* **Example:** `Router(config)#voice register pool 5`	Enters voice register pool configuration mode to set phone-specific parameters for a SIP phone.
Step 7	**apply-config** **Example:** `Router(config-register-pool)#apply-config`	Applies configuration for the Cisco Unified SIP IP phones 8961, 9951, and 9971 and restarts all other SIP phones.
Step 8	**end** **Example:** `Router(config-register-pool)# end`	Returns to privileged EXEC mode.

Examples

The following example shows the **apply-config** command configured in voice register pool 5:

```
Router# configure terminal
Router(config)#voice register pool 5
Router(config-register-pool)#apply-config
```

SIP: Configuring Video Bandwidth Control for SIP to SIP Video Calls

To configure video bandwidth control for SIP to SIP video calls, perform the following steps:

Prerequisites

Cisco Unified CME 8.6 or a later version.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **voice register global**
4. **bandwidth video tias-modifier** *bandwidth value* **[negotiate** *end-to-end***]**
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**voice register global** **Example:** `Router(config)#voice register global`	Enters voice register global configuration mode to set parameters for all supported SIP phones in Cisco Unified CME.
Step 4	**bandwidth video tias-modifier** *bandwidth value* [**negotiate** *end-to-end*] **Example:** `Router(config-register-global)#bandwidth video tias-modifier 512000 negotiate end-to-end`	Allows to set the maximum video bandwidth bits per second for SIP phones. • *bandwidth value*—Bandwidth value in bits per second. Range: 1 to 99999999. • **negotiate** *end-to-end*—Bandwidth negotiation policy. Negotiates the minimum SIP-line video bandwidth in SDP end-to-end.
Step 5	**end** **Example:** `Router(config-register-global)# end`	Returns to privileged EXEC mode.

Example

The following example shows the **bandwith video tias-modifier** command configured under voice register global configuration mode:

```
Router#show run
!
!
!
voice service voip
 allow-connections sip to sip
!
!
voice register global
 mode cme
 source-address 10.100.109.10 port 5060
 bandwidth video tias-modifier 512000 negotiate end-to-end
 max-dn 200
 max-pool 42
 create profile sync 0004625832149157
!
voice register pool  1
 id mac 1111.1111.1111
 camera
 video
```

SCCP: Enabling Support for Video Streams Across H.323 Networks

To enable slow connect procedures in Cisco Unified CME for H.323 networks and H.323 video endpoints, perform the following steps:

Prerequisites

For video supplementary services across an H.323 network, H.450 (H.450.2, H.450.3, or H.450.1) standard protocol is required.

Restrictions

Tandberg versions E3.0 and E4.1 and Polycom Release version 7.5.2 are the only H.323 video endpoints supported by Cisco Unified CME.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **voice service voip**
4. **h323**
5. **call start slow**
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**voice service voip** **Example:** `Router(config)# voice service voip`	Enters voice-service configuration mode.
Step 4	**h323** **Example:** `Router(config-voi-serv)# h323`	Enters H.323 voice-service configuration mode.

	Command or Action	Purpose
Step 5	**call start slow** **Example:** `Router(config-serv-h323)# call start slow`	Forces an H.323 gateway to use slow-connect procedures for all VoIP calls.
Step 6	**end** **Example:** `Router(config-serv-h323)# end`	Returns to privileged EXEC mode.

SCCP: Enabling System-Level Video Capabilities

To enable video capabilities and set video parameters for all video-capable phones associated with a Cisco Unified CME router, perform the following steps:

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **telephony-service**
4. **service phone videoCapability** {**0** | **1**}
5. **video**
6. **maximum bit-rate** *value*
7. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**telephony-service** **Example:** `Router(config)# telephony-service`	Enters telephony-service configuration mode.

	Command or Action	Purpose
Step 4	**service phone videoCapability {0 | 1}** **Example:** `Router(config-telephony)# service phone videoCapability 1`	Enables or disables video capability parameter for all applicable IP phones associated with a Cisco Unified CME router. • The parameter name is word and case-sensitive. • **0**—Disable (default). • **1**—Enable.
Step 5	**video** **Example:** `Router(config-telephony)# video`	(Optional) Enters video configuration mode. • Required only if you want to modify the maximum value of the video bandwidth for all video-capable phones.
Step 6	**maximum bit-rate** *value* **Example:** `Router(conf-tele-video)# maximum bit-rate 256`	(Optional) Sets the maximum IP phone video bandwidth, in kilobits per second. • *value*—Range: 0 to 10000000. Default: 10000000.
Step 7	**end** **Example:** `Router(conf-tele-video)# end`	Exits to privileged EXEC mode.

SCCP: Enabling Video Capabilities on a Phone

To enable video for video-capable phones associated with a Cisco Unified CME router, perform the following steps for each phone.

Prerequisites

- Video capabilities are enabled at a system level. See the "SCCP: Enabling System-Level Video Capabilities" section on page 1414.
- Use the **show ephone registered** command to identify individual video-capable SCCP phones, by ephone-tag, that are registered in Cisco Unified CME. The following example shows that ephone 1 has video capabilities and ephone 2 is an audio-only phone:

```
Router# show ephone registered

ephone-1 Mac:0011.5C40.75E8 TCP socket:[1] activeLine:0 REGISTERED in SCCP ver 6 +
Video and Server in ver 5
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 paging 0 debug:0 caps:7
IP:10.1.1.6 51833 7970 keepalive 35 max_line 8
button 1: dn 1 number 8003 CH1 IDLE CH2 IDLE

ephone-2 Mac:0006.D74B.113D TCP socket:[2] activeLine:0 REGISTERED in SCCP ver 6 and
Server in ver 5
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 paging 0 debug:0 caps:7
IP:10.1.1.4 51123 Telecaster 7960 keepalive 36 max_line 6
button 1: dn 2 number 8004 CH1 IDLE CH2 IDLE
button 2: dn 4 number 8008 CH1 IDLE CH2 IDLE
========================================
```

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ephone** *phone-tag*
4. **video**
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**ephone** *phone-tag* **Example:** `Router(config)# ephone 6`	Enters ephone configuration mode. • *phone-tag*—Unique sequence number that identifies an ephone during configuration tasks.
Step 4	**video** **Example:** `Router(config-ephone)# video`	Enables video capabilities on the specified ephone.
Step 5	**end** **Example:** `Router(config-ephone)# end`	Exits ephone configuration mode and enters privileged EXEC mode.

Verifying Video Support

Use the **show running-config** command to verify the video settings in the configuration.

See the telephony-service portion of the output for commands that configure video support on the Cisco Unified CME.

See the ephone portion of the output for commands that configure video support for a specific ephone.

The following example shows the telephony-service portion of the output:

```
telephony-service
 video
  maximum bit-rate 256
 load 7960-7940 P00306000404
 max-ephones 24
 max-dn 24
 ip source-address 10.0.180.130 port 2000
 service phone videoCapability 1
 timeouts interdigit 4
 timeouts ringing 100
 create cnf-files version-stamp Jan 01 2002 00:00:00
 keepalive 60
 max-conferences 4 gain -6
 call-park system redirect
 call-forward pattern .T
 web admin system name cisco password cisco
 web customize load xml.jeff
 dn-webedit
 time-webedit
 transfer-system full-consult
 transfer-pattern .T
```

The following example shows the ephone portion of the output:

```
ephone  6
 video
 mac-address 000F.F7DE.CAA5
 type 7960
 button  1:6
```

Troubleshooting Video Support

For SCCP endpoint troubleshooting, use the following **debug** commands:

- **debug cch323 video**—Enables video debugging trace on the H.323 service-provider interface (SPI).
- **debug ephone detail**—Debugs all Cisco Unified IP phones that are registered to the router, and displays error and state levels.
- **debug h225 asn1**—Displays Abstract Syntax Notation One (ASN.1) contents of H.225 messages that have been sent or received.
- **debug h245 asn1**—Displays ASN.1 contents of H.245 messages that have been sent or received.
- **debug voip ccapi inout**—Displays the execution path through the call-control application programming interface (CCAPI).

Step 3 For ephone troubleshooting, use the following **debug** commands:

- **debug ephone message**—Enables message tracing between Cisco Unified IP phones.
- **debug ephone register**—Sets registration debugging for Cisco Unified IP phones.
- **debug ephone video**—Sets ephone video traces, which provide information about different video states for the call, including video capabilities selection, start, and stop.

Step 4 For basic video-to-video call checking, use the following **show** commands:

- **show call active video**—Displays call information for SCCP video calls in progress.
- **show ephone offhook**—Displays information and packet counts for ephones that are off-hook.
- **show ephone registered**—Displays the status of registered ephones.
- **show voip rtp connections**—Displays information about RTP named-event packets, such as caller ID number, IP address, and port for both the local and remote endpoints.

Where to Go Next

After enabling video for video-capable phones in Cisco Unified CME, you must generate a new configuration file. See the "Generating Configuration Files for Phones" section on page 359.

Additional References

The following sections provide references related to Cisco Unified CME features.

Related Documents

Related Topic	Document Title
Cisco Unified CME configuration	• *Cisco Unified CME Command Reference* • Cisco Unified CME Documentation Roadmap
Cisco IOS commands	• *Cisco IOS Voice Command Reference* • Cisco IOS Software Releases 12.4T Command References
Cisco IOS configuration	• *Cisco IOS Voice Configuration Library* • Cisco IOS Software Releases 12.4T Configuration Guides
Phone documentation for Cisco Unified CME	• User Documentation for Cisco Unified IP Phones

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Feature Information for Video Support

Table 88 lists the features in this module and enhancements to the features by version.

To determine the correct Cisco IOS release to support a specific Cisco Unified CME version, see the *Cisco Unified CME and Cisco IOS Software Version Compatibility Matrix* at http://www.cisco.com/en/US/docs/voice_ip_comm/cucme/requirements/guide/33matrix.htm.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note The following table lists the Cisco Unified CME version that introduced support for a given feature. Unless noted otherwise, subsequent versions of Cisco Unified CME software also support that feature.

Table 88 Feature Information for Video Support

Feature Name	Cisco Unified CME Version	Feature Information
SIP Trunk Video Support	7.1	Support was added for video calls between SCCP endpoints across different Cisco Unified CME routers connected through a SIP trunk. H.264 codec support was added.
Video Support	4.0	Video support was introduced.