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## Choosing Between the Hardware Media Server and the Express Media Server

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## About the Hardware Media Server and the Express Media Server

All Cisco Unified MeetingPlace Release 8.5 systems that will use audio or video need a media server and the media server can be either a Hardware Media Server (HMS) or an Express Media Server (EMS).

- The Express Media Server is a set of software modules, including an audio mixer and a video switcher, that resides on the Application Server. The Express Media Server creates a single box software-only solution for Cisco Unified MeetingPlace. The Express Media Server is based on the Cisco Unified MeetingPlace Express Video Telephony (VT) product.
- The Hardware Media Server is comprised of Audio and Video Blades.

All Cisco Unified MeetingPlace Release 8.5 systems automatically come with an Express Media Server. If you want to use a Hardware Media Server, you must purchase, install, and configure it first.

On a multinode system (with Cisco WebEx scheduling), you may use only the Express Media Server or the Hardware Media Server within a site. If you mix both EMS and HMS on the same site, then users may notice video quality differences for different meetings, depending on the media server that is being used. On a multinode system, one site can have the Express Media Server, while another site has the Hardware Media Server.

There can be more or less differences based on your configuration and the environment in which the media servers are deployed.

## General Differences

**Table: General Differences Between the Express Media Server and the Hardware Media Server**

Feature	Express Media Server	Hardware Media Server
Type	Software residing on the Application Server	Hardware, comprised of Audio and Video Blades. For video to work, each Audio Blade must have a Video Blade associated with it.
Installation	Installed automatically when you install the Application Server	Separate chassis, audio/video blade installation required and configuration steps
Configuration	Configured through the Administration Center of the Application Server	Configured through the Media Server Administration
Recording	<p>Can record the audio portion of scheduled meetings. Cannot record the video portion of scheduled meetings.</p> <p>Can support 20 simultaneous recordings with each recording using one port.</p>	Can record the audio and video portions of scheduled meetings.
Cascading	Does not support any internal cascading of audio and video data	Uses internal cascading between blades for scalability
Resource management	<p>Based on the number of System Resource Units (SRUs), which is based on the type of Cisco MCS on which the Application Server is installed.</p> <p>High complexity codecs are used on a first come, first served basis.</p> <p>The number of available audio ports decreases by an 8 to 1 ratio when the system is configured for high-quality mode.</p>	<p>Based on the following:</p> <ul style="list-style-type: none"> <li>• The number of Audio and Video Blades that are physically installed on the chassis.</li> <li>• For audio: The global audio mode (higher capacity or higher quality)</li> </ul>

		<p>that is set for the system.</p> <ul style="list-style-type: none"> <li>• For video: The mode (standard or high rate) that is set at the user profile level.</li> </ul> <p>The number of available audio ports decreases to two-thirds when the system is configured for high-quality mode.</p>
High complexity codecs	G.729 and G.722 is considered a high complexity codec (no support for iLBC)	G.729 is <i>not</i> considered a high complexity codec unless line echo cancellation is turned on for it. G.722 and iLBC are considered high complexity codecs
Video composition	<p>Not supported.</p> <p>All non-speaker participants see the video of the active speaker only and the active speaker sees the video of last speaker.</p>	<p>Supports video composition.</p> <p>All non-speaker participants see the video of the last N speakers (where N is based on the layout selected by the system administrator).</p> <p>N speakers see N-1 remaining speakers (minus themselves) and one additional participant.</p> <p>N participants are composed into a single layout.</p>
Muting	When audio is muted, video is not muted.	When audio is muted, video is muted.
Transrating	<p>Not supported.</p> <p>The system uses flow-control mechanisms</p>	Supports true transrating, so you can have an 384Kbps connection in the same

Table: General Differences Between the Express Media Server and the Hardware Media Server 3

	to force all connections to the same bandwidth. It restricts a meeting to use only a range of the bandwidth to accommodate the lowest speed participant in the meeting.	meeting as a 2Mb connection, without affecting the interaction between high rate participants.
Transcoding between H.263 and H.264 AVC	Not supported between H.263 and H.264 AVC endpoints in the same meeting. A meeting can include either H.263 or H.264 video endpoints.	Supported.
H.261	Not supported.	Supports H.261 in high rate mode and provides transcoding between H.261 and H.263/H.264.
Video resolution	Supports the following: <ul style="list-style-type: none"> <li>• 320x180</li> <li>• 640x360 (for Cisco soft clients)</li> <li>• 640x480 (for Cisco 99xx phones)</li> <li>• 1280x720 (720p) for Cisco soft clients</li> <li>• CIF, QCIF</li> </ul>	Allows 320x180, but it will probably be mangled. Does not allow the other resolutions.  Works with QCIF, QSIF, SIF, and CIF and provides transcoding between them.
Custom video types	Can make custom video types. Has more predefined video types.	Not supported.
Video type management	Supported.  Users can configure their own video types for a meeting (codec and bitrate)	Not supported.  Only two system defaults are available: standard rate and high rate.
H.263 at 4CIF	Not supported.	Supported.
In-band (voice band) DTMF detection, audio codec iLBC, jitter buffer configuration	Not supported.	Supported.
Automatic gain control (AGC)	Supported.	Supported.
Echo cancellation	Supported.	Supported.
The system calls a user for a web meeting, and the user turns on the desktop camera. When the user is speaking, the WebEx video shows the user to the other attendees in the meeting.	Supported.	Not supported.

## Differences in Audio and Video Codecs

	Audio Codecs Supported	Video Codecs Supported
Hardware Media Server	<ul style="list-style-type: none"> <li>• G.711</li> <li>• G.722<sup>1</sup></li> <li>• G.729a<sup>1</sup></li> <li>• G.729b<sup>1</sup></li> <li>• iLBC<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>• H.261</li> <li>• H.263</li> <li>• H.264/AVC<sup>2</sup></li> </ul>
Express Media Server	<ul style="list-style-type: none"> <li>• G.711</li> <li>• G.729a<sup>3</sup></li> <li>• G.722<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>• H.263</li> <li>• H.264/AVC</li> </ul>

1. When using these codecs, capacity changes from 250 ports per blade to 166 ports per blade.
2. Any combination in the same meeting.
3. For more information on using these codecs and capacity, see the [Resource Management and System Capacity for Systems Using the Express Media Server](#).

## Line Echo Cancellation

The Express Media Server and Hardware Media Server both include an echo canceller for controlling echo on incoming audio connections, so any echo originating from a phone or long distance connection can disrupt the conference. In general, echo cancellation is not required in a conference bridge, providing the following conditions are true:

1. All the voice gateways connecting the public switched telephone network to the internal network are provisioned to provide echo cancellation. Usually 64ms of echo cancellation is sufficient, but intercontinental calls may benefit from 128ms.
2. Substantially all calls are originating and terminating within the same continent. If you have 128ms of echo cancellation in the voice gateways, then intercontinental calls between developed countries will likely be covered, provided no connections through satellites are employed. Intercontinental calls involving 3rd world countries are likely to have echo exceeding 128ms., which cannot be controlled by most voice gateways.
3. Internal phones and headsets are well maintained. Defective phones or headsets, including echo cancelling headsets with dead batteries, are a common source of echo.

Note that acoustic echo, typically from a speakerphone in a conference room, cannot be effectively cancelled by either type of media server. This type of echo should be controllable through proper configuration and use of a good quality speaker phone.

## About Ad-Hoc Conferencing

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- [How the System Uses Ad-Hoc Voice Ports](#)

- Recommendations for Users Using Ad-Hoc Conferencing

## Overview of Ad-Hoc Conferencing

**Note:** Release 8.5.2 supports ad-hoc conferencing.

Ad-hoc meetings are not controlled by Cisco Unified MeetingPlace. Cisco Unified Communications Manager manages and controls the exchange of conference control messages and the voice and video media control messages between endpoints in ad-hoc meetings. The Cisco Unified MeetingPlace Express Media Server, which contains an audio mixer and a video switcher, acts as a conference bridge to Cisco Unified Communications Manager and provides only the media resources.

Users initiate ad-hoc meetings through the user interfaces of products other than Cisco Unified MeetingPlace. For example, users can initiate either a voice-only or a voice-and-video ad-hoc meeting by using the CONF or Meet-Me buttons on Cisco Unified IP Phones that are registered to Cisco Unified Communications Manager. Users can also add web conferencing to conversations initiated through Cisco Unified Personal Communicator.

**Note:** Users with H.323 video terminals, which are registered to a Cisco IOS gatekeeper and have an H.225 trunk to Cisco Unified Communications Manager, can also initiate ad-hoc conferences. There is no CONF button on the terminals, but once users initiate an ad-hoc conferences from Cisco endpoints using the Meet-Me number, they can call in to the same ad-hoc conf from the terminals.

In contrast, scheduled and reservationless meetings are set up, managed, and controlled by Cisco Unified MeetingPlace. Users can schedule meetings through WebEx scheduling (or MeetingPlace scheduling) or through the Microsoft Outlook plug-in and can call in to or call out of the meeting by using the phone, the user web interface, or video endpoints.

By configuring your Cisco Unified MeetingPlace server as a Cisco video conference bridge (IPVC-35xx) in Cisco Unified Communications Manager, you can provide audio/video ad-hoc conferencing for the these endpoints:

- All voice and video endpoints that support Cisco Unified Communications Manager meet-me and Confrn button (ad-hoc conferences) voice and video only.
- Cisco Unified Personal Communicator-voice/video, with optionally web (provided by Cisco WebEx).

Ad-Hoc Meetings	Scheduled/Reservationless Meetings
Set up, managed, and controlled by Cisco Unified Communications Manager	Set up, managed, and controlled by Cisco Unified MeetingPlace
Meetings scheduled through IP phones or Cisco Unified Personal Communicator	Meetings scheduled through WebEx scheduling (or MeetingPlace scheduling) or through Microsoft Outlook
.	Call into or out of meetings by phone, web, or video endpoints (scheduled meetings)
Does not support recording	Supports recording

## Related Topics

- For information about meet-me and ad-hoc conferences, see the "Conference Bridges" chapter of the *Cisco Unified Communications Manager System Guide* for your specific release, go to [http://www.cisco.com/en/US/products/sw/voicesw/ps556/prod\\_maintenance\\_guides\\_list.html](http://www.cisco.com/en/US/products/sw/voicesw/ps556/prod_maintenance_guides_list.html).
- For details about Cisco Unified Personal Communicator, go to <http://www.cisco.com/en/US/products/ps6844/index.html>.

## How the System Uses Ad-Hoc Voice Ports

The Cisco Unified MeetingPlace system uses ad-hoc voice ports in these situations:

- One port for each endpoint in a voice call that includes three or more endpoints. (A direct, voice-only call between two endpoints does not use any ad-hoc voice ports.)
- One port when a Cisco Unified IP Phone is used to create the meeting through the Meet-Me button.
- Another port for each additional endpoint that calls into the ad-hoc conference.
- One voice port for each utilized video port.

## Recommendations for Users Using Ad-Hoc Conferencing

The video switcher of the Express Media Server switches the video stream to the current active speaker, which is the *loudest* speaker as determined by the audio mixer.

Provide these recommendations to help reduce background noise during conference calls:

- Mute your phone when you are not speaking.
- Do not use a speakerphone, which might generate echoes, ringing sounds, or audio feedback.
- If you use a microphone that is built into your video camera, keep the camera away from fans, vents, and other sources of noise.
- For softphones, such as Cisco Unified Personal Communicator with a Cisco VT Camera or Cisco IP Communicator with Cisco Unified Video Advantage:
  - ◆ Do not use the microphone that is built into your computer. These microphones tend to pick up a lot of background noise.
  - ◆ We strongly recommend that you use a headset that is equipped with a microphone.
  - ◆ Whenever multiple microphones are available, make sure that your computer and video endpoint are configured to use the desired microphone.

For example, suppose that you use Cisco Unified Personal Communicator with a Cisco VT Camera on a Windows XP operating system, and that you have a headset that is equipped with a microphone. To make sure that your system is configured to use the headset microphone, select **Start > Control Panel > Sounds and Audio Devices**. Then select the **Audio** tab, and make sure that your headset is selected as the sound recording device. See the documentation for your specific endpoint product to optimize audio settings and resolve audio problems.