



# Configure Transcoders and Media Termination Points

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## Transcoders and Media Termination Points Overview

### Transcoders

A transcoder is a device that performs codec conversion, it converts an input stream from one codec into an output stream that uses a different codec. For example, a transcoder can take a G.711 stream and convert it to a G.729 stream in real time. During a call when the endpoints use different voice codecs, the Cisco Unified Communications Manager invokes a transcoder into the media path. The transcoder converts the data streams between the two incompatible codecs to allow communication between the devices. The transcoder is invisible to the user or the endpoints involved in a call.

Transcoder resources is managed by the Media Resource Manager (MRM).



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**Note** The transcoder supports transcoding between G.711 and all codecs, including G.711, when functioning as a transcoder and when providing MTP/TRP functionality.

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### Transcoders and the Media Resource Manager

All Cisco Unified Communications Manager nodes can access transcoders through the Media Resource Manager (MRM). The MRM manages access to transcoders.

The MRM makes use of Cisco Unified Communications Manager media resource groups and media resource group lists. The media resource group list allows transcoders to communicate with other devices in the assigned media resource group, which in turn, provides management of resources within a cluster.

A transcoder control process gets created for each transcoder device that is defined in the database. The MRM keeps track of the transcoder resources and advertises their availability throughout the cluster.

## Transcoders as Media Termination Points

Hardware-based transcoder resources also support Media Termination Point (MTP) and/or Trust Relay Point (TRP) functionality. In this capacity, when Cisco Unified Communications Manager determines that an endpoint in a call requires an MTP or TRP, it can allocate a transcoder resource and insert it into the call, where it acts like an MTP transcoder.

Cisco Unified Communications Manager supports MTP and TRP and transcoding functionality simultaneously. For example, if a call originates from a Cisco Unified IP Phone (located in the G723 region) to NetMeeting (located in the G711 region), one transcoder resource supports MTP and transcoding functionality simultaneously.

If a software MTP resource is not available when it is needed, the call tries to connect without using an MTP resource and MTP/TRP services. If hardware transcoder functionality is required (to convert one codec to another) and a transcoder is not available, the call will fail.




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**Note** The transcoder supports transcoding between G.711 and all codecs, including G.711, when functioning as a transcoder and when providing MTP/TRP functionality.

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## Transcoder Types

Transcoder types in Cisco Unified Communications Manager Administration are listed in the following table.




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**Note** The transcoder supports transcoding between G.711 and all codecs, including G.711, when functioning as a transcoder and when providing MTP/TRP functionality.

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**Table 1: Transcoder Types**

Transcoder Type	Description
Cisco Media Termination Point Hardware	<p>This type, which supports the Cisco Catalyst 4000 WS-X4604-GWY and the Cisco Catalyst 6000 WS-6608-T1 or WS-6608-E1, provides the following number of transcoding sessions:</p> <p>For the Cisco Catalyst 4000 WS-X4604-GWY</p> <ul style="list-style-type: none"> <li>• For transcoding to G.711-16 MTP transcoding sessions</li> </ul> <p>For the Cisco Catalyst 6000 WS-6608-T1 or WS-6608-E1</p> <ul style="list-style-type: none"> <li>• For transcoding from G.723 to G.711/For transcoding from G.729 to G.711-24 MTP transcoding sessions per physical port; 192 sessions per module</li> </ul>

Transcoder Type	Description
Cisco IOS Media Termination Point (hardware)	<p>This type, which supports the Cisco 2600XM, Cisco 2691, Cisco 3725, Cisco 3745, Cisco 3660, Cisco 3640, Cisco 3620, Cisco 2600, and Cisco VG200 gateways, provides the following number of transcoding sessions:</p> <p>Per NM-HDV</p> <ul style="list-style-type: none"> <li>• Transcoding from G.711 to G.729-60</li> <li>• Transcoding from G.711 to GSM FR/GSM EFR- 45</li> </ul>
Cisco IOS Enhanced Media Termination Point (hardware)	<p><b>Per NM-HD</b></p> <p>This type, which supports Cisco 2600XM, Cisco 2691, Cisco 3660, Cisco 3725, Cisco 3745, and Cisco 3660 Access Routers, provides the following number of transcoding sessions:</p> <ul style="list-style-type: none"> <li>• Transcoding for G.711 to G.729a/G.729ab/GSMFR-24</li> <li>• Transcoding for G.711 to G.729/G.729b/GSM EFR-18</li> </ul> <p><b>Per NM-HDV2</b></p> <p>This type, which supports Cisco 2600XM, Cisco 2691, Cisco 3725, Cisco 3745, and Cisco 3660 Access Routers, provides the following number of transcoding sessions:</p> <ul style="list-style-type: none"> <li>• Transcoding for G.711 to G.729a/G.729ab/GSMFR-128</li> <li>• Transcoding for G.711 to G.729/G.729b/GSM EFR-96</li> </ul> <p><b>PVDM4</b></p> <ul style="list-style-type: none"> <li>• Onboard PVDM4 modules (PVDM4-32, PVDM4-64, PVDM4-128, PVDM4-256)</li> <li>• DSP module on T1/E1 modules (PVDM4-32, PVDM4-64, PVDM4-128, PVDM4-256)</li> <li>• DSP NIMs (NIM-PVDM4-32, NIM-PVDM4-64, NIM-PVDM4-128, NIM-PVDM4-256)</li> </ul> <p>These types support ISR4K (ISR44xx, ISR43xx), C83xx, and C82xx platforms provide the following number of transcoding sessions:</p> <ul style="list-style-type: none"> <li>• Transcoding for G.711 to G.729a/G.729ab/GSMFR-24</li> <li>• Transcoding for G.711 to G.729/G.729b/GSM EFR-18</li> <li>• Transcoding for G.711 to G.729a/G.729ab/GSMFR-128</li> <li>• Transcoding for G.711 to G.729/G.729b/GSM EFR-96</li> <li>• Transcoding for G.711/G.729/G.729ab/G.729a/G.729b to Opus</li> </ul>

Transcoder Type	Description
Cisco Media Termination Point (WS-SVC-CMM)	<p>This type provides 64 transcoding sessions per daughter card that is populated: 64 transcoding sessions with one daughter card, 128 transcoding sessions with two daughter cards, 192 transcoding sessions with three daughter cards, and 256 transcoding sessions with four daughter cards (maximum).</p> <p>This type provides transcoding between any combination of the following codecs:</p> <ul style="list-style-type: none"> <li>• G.711 a-law and G.711 mu-law</li> <li>• G.729 annex A and annex B</li> <li>• G.723.1</li> <li>• GSM (FR)</li> <li>• GSM (EFR)</li> </ul>

## Transcoder Failover and Fallback

The following items describe the transcoder device recovery methods when the transcoder is registered to a Cisco Unified Communications Manager node that goes inactive:

- If the primary Cisco Unified Communications Manager node fails, the transcoder attempts to register with the next available node in the Cisco Unified Communications Manager Group that is specified for the device pool to which the transcoder belongs.
- The transcoder device reregisters with the primary Cisco Unified Communications Manager node as soon as it becomes available.
- A transcoder device unregisters with a Cisco Unified Communications Manager node that becomes unreachable. The calls that were on that node will register with the next Cisco Unified Communications Manager node in the list.
- If a transcoder attempts to register with a new Cisco Unified Communications Manager node and the register acknowledgment is never received, the transcoder registers with the next node in the list.

Transcoder devices will unregister and then disconnect after a hard or soft reset. After the reset completes, the devices reregister with the primary Cisco Unified Communications Manager node.

## Media Termination Points

Media Termination Points (MTP) allow Unified Communications Manager to relay calls that are routed through SIP or H.323 endpoints or gateways. Media Termination Points extend supplementary services, such as call hold, call transfer, call park, and conferencing, that are normally not available when a call is routed to an H.323 endpoint. For H.323 supplementary services, MTPs are only required for endpoints that do not support EmptyCapability Set (ECS) or FastStart. All Cisco and other third party other endpoints that support ECS and FastStart do not require an MTP.

An MTP device always registers with its primary Unified Communications Manager if that Unified Communications Manager is available and informs the Unified Communications Manager about the number of MTP resources it supports. You can register multiple MTPs with the same Unified Communications

Manager. When more than one MTP is registered with a Unified Communications Manager, that Cisco Unified Communications Manager controls the set of resources for each MTP.

For example, consider MTP server 1 as configured for 48 MTP resources, and the MTP server 2 as configured for 24 resources. If both MTPs register with the same Unified Communications Manager, that Unified Communications Manager maintains both sets of resources for a total of 72 registered MTP resources.

When the Unified Communications Manager determines that a call endpoint requires an MTP, it allocates an MTP resource from the MTP that has the least active streams. That MTP resource gets inserted into the call on behalf of the endpoint. MTP resource use remains invisible to both the users of the system and to the endpoint on whose behalf it was inserted. If an MTP resource is not available when it is needed, the call connects without using an MTP resource, and that call does not have supplementary services.

## MTP Failover and Fallback

This section describes how MTP devices failover and fallback when the Cisco Unified Communications Manager to which they are registered becomes unreachable:

- If the primary Cisco Unified Communications Manager fails, the MTP attempts to register with the next available Cisco Unified Communications Manager in the Cisco Unified Communications Manager Group that is specified for the device pool to which the MTP belongs.
- The MTP device reregisters with the primary Cisco Unified Communications Manager as soon as it becomes available after a failure and is currently not in use.
- The system maintains the calls or conferences that were active in call preservation mode until all parties disconnect. The system does not make supplementary services available.
- If an MTP attempts to register with a new Cisco Unified Communications Manager and the register acknowledgment is never received, the MTP registers with the next Cisco Unified Communications Manager.

The MTP devices unregister and then disconnect after a hard or soft reset. After the reset completes, the devices reregister with the Cisco Unified Communications Manager.

## Software Media Termination Point Type

Software Media Termination Point type in Cisco Unified Communications Manager Administration is listed in the following table.

Software MTP Type	Description
Cisco Media Termination Point Software	<p>A single MTP provides a default of 48 MTP (user configurable) resources, depending on the speed of the network and the network interface card (NIC). For example, a 100-MB Network/NIC card can support 48 MTP resources, while a 10-MB NIC card cannot.</p> <p>For a 10-MB Network/NIC card, approximately 24 MTP resources can be provided; however, the exact number of MTP resources that are available depends on the resources that other applications on that PC are consuming, the speed of the processor, network loading, and various other factors.</p>

# Transcoders and MTPs Configuration Task Flow

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	To <a href="#">Configure Transcoders, on page 6</a> , complete the following sub tasks: <ul style="list-style-type: none"> <li>• <a href="#">Configure Transcoders, on page 7</a></li> <li>• <a href="#">Add Transcoder to Media Resource Group, on page 7</a></li> </ul>	If you need to configure a transcoder, follow this step. Transcoders convert an input stream from one codec into an output stream that uses a different codec.
<b>Step 2</b>	To <a href="#">Configure a Software MTP, on page 8</a> , complete the following sub tasks: <ul style="list-style-type: none"> <li>• <a href="#">Configure Media Termination Points, on page 9</a></li> <li>• <a href="#">Add Software MTP to Media Resource Group, on page 9</a></li> </ul>	If you need to configure a software MTP, follow this step. Software MTPs allow Cisco Unified Communications Manager to relay calls that are routed through SIP or H.323 endpoints or gateways.

## Configure Transcoders

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Determine the number of transcoder resources that are needed and the number of transcoder devices that are needed to provide these resources.	For a multi-site deployment, Cisco recommends placing a transcoder local at each site where it might be required. If multiple codecs are needed, it is necessary to know how many endpoints do not support all codecs, where those endpoints are located, what other groups will be accessing those resources, how many maximum simultaneous calls these device must support, and where those resources are located in the network.
<b>Step 2</b>	<a href="#">Configure Transcoders, on page 7</a>	Configure transcoders to convert an input stream from one codec into an output stream that uses a different codec.
<b>Step 3</b>	<a href="#">Add Transcoder to Media Resource Group, on page 7</a>	Add the new transcoders to the appropriate media resource groups.
<b>Step 4</b>	Restart the transcoder devices.	See the transcoder documentation for details.

## Configure Transcoders

A transcoder is a device that converts an input stream from one codec into an output stream that uses a different codec.

### Before you begin

The Cisco IP Voice Media Streaming service must be running for the IVR to be active.

Determine the number of transcoder resources that are needed and the number of transcoder devices that are needed to provide these resources.

### Procedure

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- Step 1** Log into Cisco Unified CM Administration and choose **Media Resources > Transcoder**.
- Step 2** Do either of the following:
- Click **Find** and select an existing transcoder.
  - Click **Add New**.
- Step 3** Select the **Transcoder Type**.
- Step 4** Enter the **MAC Address** of the transcoder.
- Step 5** Assign a **Device Pool** from the drop-down menu.
- Step 6** Check the **Trusted Relay Point** check box if you want to make this transcoder available as a trusted relay point.
- Step 7** Click **Save**.
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## Add Transcoder to Media Resource Group

### Before you begin

[Configure Transcoders, on page 7](#)

### Procedure

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- Step 1** Choose **Media Resources > Media Resource Group**.
- Step 2** Click **Find** to display the list of configured Media Resource Groups.
- Step 3** Click on the required Media Resource Group.  
The **Media Resource Group Configuration** window displays.
- Step 4** Select the transcoder from the list of available media resources and add it to the Selected Media Resources list.
- Step 5** Click **Save**.
- Step 6** Navigate to **Media Resources > Media Resource Group**.
- Step 7** In the **Find and List Transcoders** window, check the check boxes next to the transcoders that you want to synchronize. To choose all transcoders in the window, check the check box in the matching records title bar.
- Step 8** Click **Apply Config to Selected**.

- The Apply Configuration Information dialog box displays.
- Step 9** Click **OK**.

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#### What to do next

Restart the transcoder device.

## Synchronize Transcoder

To synchronize a transcoder with the most recent configuration changes, perform the following procedure, which applies any outstanding configuration settings in the least-intrusive manner possible. (For example, a reset/restart may not be required on some affected devices.)

#### Procedure

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- Step 1** Choose **Media Resources > Transcoder**.  
The Find and List Transcoders window displays.
- Step 2** Choose the search criteria to use.
- Step 3** Click **Find**.  
The window displays a list of transcoders that match the search criteria.
- Step 4** Check the check boxes next to the transcoders that you want to synchronize. To choose all transcoders in the window, check the check box in the matching records title bar.
- Step 5** Click **Apply Config to Selected**.  
The Apply Configuration Information dialog box displays.
- Step 6** Click **OK**.
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## Configure a Software MTP

This procedure describes the steps to configure a software MTP. For information about configuring a hardware MTP, see [Configure Transcoders, on page 6](#).

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<a href="#">Configure Media Termination Points, on page 9</a>	Configure a media termination point to relay calls that are routed through SIP endpoints or gateways.
<b>Step 2</b>	<a href="#">Add Software MTP to Media Resource Group, on page 9</a>	Add the new media termination point to the appropriate media resource groups.
<b>Step 3</b>	Restart the media termination point devices.	



## Configure Media Termination Points

Use this procedure to configure a software Media Termination Point (MTP).

### Before you begin

The Cisco IP Voice Media Streaming service must be running for the software Media Termination Point (MTP) to be active.

Determine the number of MTP resources that are needed and the number of MTP devices that are needed to provide these resources.

### Procedure

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- Step 1** From Cisco Unified CM Administration, choose **Media Resources > Media Termination Point**.
- Step 2** Do either of the following:
- Click **Find** and select an existing MTP.
  - Click **Add New** to create a new MTP.
- Step 3** Assign a **Media Termination Point Name**.
- Step 4** Assign a **Device Pool**.
- Step 5** Check the **Trusted Relay Point** check box if you want to designate this MTP as a Trusted Relay Point (TRP).
- Step 6** Click **Save**.
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## Add Software MTP to Media Resource Group

### Before you begin

[Configure Media Termination Points, on page 9](#)

### Procedure

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- Step 1** Choose **Media Resources > Media Resource Group**.
- Step 2** Click **Find** to display the list of configured Media Resource Groups.
- Step 3** Click on the required Media Resource Group.  
The **Media Resource Group Configuration** window displays.
- Step 4** Select the transcoder from the list of **Available Media Resources** and add it to the **Selected Media Resources** list.
- Step 5** Click **Save**.
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### What to do next

Restart the media termination point device.

# Transcoders and MTPs Interactions and Restrictions

## Transcoder Interactions and Restrictions

### Transcoder Interactions and Restrictions

Interactions or Restriction	Description
Transcoder Deletion	<p>You cannot delete a transcoder that is assigned to a media resource group. To find out which media resource groups are using the transcoder, click <b>Dependency Records</b> from the <b>Related Links</b> drop-down list box on the <b>Transcoder Configuration</b> window and click <b>Go</b>. The Dependency Records Summary window displays information about media resource groups that are using the transcoder. To find out more information about the media resource group, click the media resource group, and the Dependency Records Details window displays. If the dependency records are not enabled for the system, the dependency records summary window displays a message. If you try to delete a transcoder that is in use, Cisco Unified Communications Manager displays a message. Before deleting a transcoder that is currently in use, you must remove the transcoder from the media resource group(s) to which it is assigned.</p>
Failover and Fallback	<p>Transcoder failover and fallback works as follows:</p> <ul style="list-style-type: none"> <li>• If the primary Unified Communications Manager node fails, the transcoder attempts to register with the next available node in the Unified Communications Manager Group that is specified for the device pool to which the transcoder belongs.</li> <li>• The transcoder device reregisters with the primary Cisco Unified Communications Manager node as soon as it becomes available.</li> <li>• A transcoder device unregisters with a Unified Communications Manager node that becomes unreachable. Calls that were using this transcoding profile for transcoding move to the preservation state and the transcoder attempts to register with the next available node. Gateway uses RTP/ RTCP timeout to inform to registered Unified Communications Manager of resource release.</li> <li>• If a transcoder attempts to register with a new Unified Communications Manager node and the register acknowledgment is never received, the transcoder registers with the next node in the list.</li> </ul> <p>Transcoder devices will unregister and then disconnect after a hard or soft reset. After the reset completes, the devices reregister with the primary Cisco Unified Communications Manager node.</p>

## Media Termination Points Interactions and Restrictions

*Table 2: Media Termination Points Interactions and Restrictions*

Restriction	Description
Cisco IP Voice Streaming Application	<p>You can activate only one Cisco IP Voice Streaming Application per server. To provide more MTP resources, you can activate the Cisco IP Voice Streaming application on additional networked servers.</p> <p>Cisco strongly recommends that you do not activate the Cisco IP Voice Streaming Media Application on a Cisco Unified Communications Manager with a high call-processing load because it can adversely affect the performance of the Cisco Unified Communications Manager.</p>
Registering with Cisco Unified Communications Manager	<p>Each MTP can register with only one Cisco Unified Communications Manager at a time. The system may have multiple MTPs, each of which may be registered to one Cisco Unified Communications Manager, depending on how your system is configured.</p>
Failover and Fallback	<p>This section describes how MTP devices failover and fallback when the Cisco Unified Communications Manager to which they are registered becomes unreachable:</p> <ul style="list-style-type: none"> <li>• If the primary Cisco Unified Communications Manager fails, the MTP attempts to register with the next available Cisco Unified Communications Manager in the Cisco Unified Communications Manager Group that is specified for the device pool to which the MTP belongs.</li> <li>• The MTP device reregisters with the primary Cisco Unified Communications Manager as soon as it becomes available after a failure and is currently not in use.</li> <li>• The system maintains the calls or conferences that were active in call preservation mode until all parties disconnect. The system does not make supplementary services available.</li> <li>• If an MTP attempts to register with a new Cisco Unified Communications Manager and the register acknowledgment is never received, the MTP registers with the next Cisco Unified Communications Manager.</li> </ul> <p>The MTP devices unregister and then disconnect after a hard or soft reset. After the reset completes, the devices reregister with the Cisco Unified Communications Manager.</p>

