Configure Transcoders and Media Termination Points

Transcoders and Media Termination Points Overview

Transcoders

A transcoder is a device that performs codec conversion, converting 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. When the two endpoints in a call use different voice codecs, Cisco Unified Communications Manager invokes a transcoder into the media path. The transcoder converts the data streams between the two incompatible codecs so that communication can occur. The transcoder is invisible to either the user or the endpoints that are involved in a call.

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

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.

Transcoders with MTP Functionality

In addition to codec conversion, a transcoder can provide the same functionality as a media termination point (MTP). In cases where both transcoder functionality and MTP functionality are needed, the system allocates a transcoder due to the fact that transcoders can provide both sets of functionality simultaneously. If only MTP functionality is required, the system allocates either a transcoder or an MTP from the resource pool. The choice of resource will be determined by the media resource groups.

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.
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 inserts 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.

---

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.

---

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.
<table>
<thead>
<tr>
<th>Transcoder Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Cisco Media Termination Point Hardware** | 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:  
For the Cisco Catalyst 4000 WS-X4604-GWY  
• For transcoding to G.711-16 MTP transcoding sessions  
For the Cisco Catalyst 6000 WS-6608-T1 or WS-6608-E1  
• 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 |
| **Cisco IOS Media Termination Point (hardware)** | 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:  
Per NM-HDV  
• Transcoding from G.711 to G.729-60  
• Transcoding from G.711 to GSM FR/GSM EFR-45 |
| **Cisco IOS Enhanced Media Termination Point (hardware)** | Per NM-HD  
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:  
• Transcoding for G.711 to G.729a/G.729ab/GSMFR-24  
• Transcoding for G.711 to G.729/G.729b/GSM EFR-18  
Per NM-HDV2  
This type, which supports Cisco 2600XM, Cisco 2691, Cisco 3725, Cisco 3745, and Cisco 3660 Access Routers, provides the following number of transcoding sessions:  
• Transcoding for G.711 to G.729a/G.729ab/GSMFR-128  
• Transcoding for G.711 to G.729/G.729b/GSM EFR-96 |
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.

<table>
<thead>
<tr>
<th>Transcoder Type</th>
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| Cisco Media Termination Point (WS-SVC-CMM)   | 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). This type provides transcoding between any combination of the following codecs:  
  - G.711 a-law and G.711 mu-law  
  - G.729 annex A and annex B  
  - G.723.1  
  - GSM (FR)  
  - GSM (EFR) |

Transcoder Failover and Fallback

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- 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.

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  - G.711 a-law and G.711 mu-law  
  - G.729 annex A and annex B  
  - G.723.1  
  - GSM (FR)  
  - GSM (EFR) |
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.

<table>
<thead>
<tr>
<th>Software MTP Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco Media Termination Point Software</td>
<td>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. 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.</td>
</tr>
</tbody>
</table>
## Transcoders and MTPs Configuration Task Flow

### Configure Transcoders

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> To Configure Transcoders, on page 6, complete the following sub tasks:</td>
<td>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.</td>
</tr>
<tr>
<td>• Configure Transcoders, on page 7</td>
<td></td>
</tr>
<tr>
<td>• Add Transcoder to Media Resource Group, on page 7</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> To Configure a Software MTP, on page 8, complete the following sub tasks:</td>
<td>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.</td>
</tr>
<tr>
<td>• Configure Media Termination Points, on page 9</td>
<td></td>
</tr>
<tr>
<td>• Add Software MTP to Media Resource Group, on page 9</td>
<td></td>
</tr>
</tbody>
</table>

## Configure Transcoders

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> Determine the number of transcoder resources that are needed and the number of transcoder devices that are needed to provide these resources.</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Step 2</strong> Configure Transcoders, on page 7</td>
<td>Configure transcoders to convert an input stream from one codec into an output stream that uses a different codec.</td>
</tr>
<tr>
<td><strong>Step 3</strong> Add Transcoder to Media Resource Group, on page 7</td>
<td>Add the new transcoders to the appropriate media resource groups.</td>
</tr>
<tr>
<td><strong>Step 4</strong> Restart the transcoder devices.</td>
<td>See the transcoder documentation for details.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Log into Cisco Unified CM Administration and choose Media Resources &gt; Transcoder.</td>
</tr>
</tbody>
</table>
| 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. |

Add Transcoder to Media Resource Group

Before you begin
Configure Transcoders, on page 7

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Choose Media Resources &gt; Media Resource Group.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Click Find to display the list of configured Media Resource Groups.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Click on the required Media Resource Group. The Media Resource Group Configuration window displays.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Select the transcoder from the list of available media resources and add it to the Selected Media Resources list.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click Save.</td>
</tr>
<tr>
<td>Step 6</td>
<td>Navigate to Media Resources &gt; Media Resource Group.</td>
</tr>
<tr>
<td>Step 7</td>
<td>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.</td>
</tr>
<tr>
<td>Step 8</td>
<td>Click Apply Config to Selected.</td>
</tr>
</tbody>
</table>
The Apply Configuration Information dialog box displays.

**Step 9**
Click **OK**.

---

**What to do next**
Restart the transcoder device.

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**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**

**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**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> Configure Media Termination Points, on page 9</td>
<td>Configure a media termination point to relay calls that are routed through SIP endpoints or gateways.</td>
</tr>
<tr>
<td><strong>Step 2</strong> Add Software MTP to Media Resource Group, on page 9</td>
<td>Add the new media termination point to the appropriate media resource groups.</td>
</tr>
<tr>
<td><strong>Step 3</strong> Restart the media termination point devices.</td>
<td></td>
</tr>
</tbody>
</table>
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

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.

Add Software MTP to Media Resource Group

Before you begin

Configure Media Termination Points, on page 9

Procedure

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.

What to do next

Restart the media termination point device.
## Transcoders and MTPs Interactions and Restrictions

### Transcoder Interactions and Restrictions

<table>
<thead>
<tr>
<th>Interactions or Restriction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transcoder Deletion</td>
<td>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 <strong>Dependency Records</strong> from the <strong>Related Links</strong> drop-down list box on the <strong>Transcoder Configuration</strong> window and click <strong>Go</strong>. 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.</td>
</tr>
</tbody>
</table>

| Failover and Fallback       | Transcoder failover and fallback works as follows:  
• 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. |

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*Configure Transcoders and Media Termination Points*
## Media Termination Points Interactions and Restrictions

### Table 2: Media Termination Points Interactions and Restrictions

<table>
<thead>
<tr>
<th>Restriction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IP Voice Streaming Application</td>
<td>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. 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.</td>
</tr>
<tr>
<td>Registering with Cisco Unified Communications Manager</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 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.  
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Media Termination Points Interactions and Restrictions