

CallManager MoH uses G.711 Codec while Voice Calls use G.729 Codec Configuration Example

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Introduction

In typical Cisco CallManager configurations, voice calls and Music on Hold (MoH) streams that must traverse a low-speed WAN link use the G.729 codec in order to save bandwidth. The use of the G.729 codec for voice or MoH traffic over a WAN link is still recommended. However, in some situations G.729 does not provide adequate quality for MoH streams. This is due to the fact that G.729 codec is optimized for speech. Therefore, it typically provides only marginal audio fidelity for MoH.

In situations where it is determined that G.729 MoH is unacceptable, you can force MoH to use G.711 while you still maintain voice calls at G.729. This is done through the use of the 'region' configuration in Cisco CallManager. When you place the MoH server in a Cisco CallManager region by itself, you can specify what codecs are used between the MoH server and other regions when a user is placed on hold or during network hold. Consequently, voice calls can still use G.729 while MoH is streamed using G.711. This results in better audio quality. This document demonstrates how to achieve this.

Note: This is only supported in centralized Cisco CallManager deployments.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on Cisco CallManager 4.0(1)sr2, but the concept applies to any Cisco CallManager release where regions can be created.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

Cisco CallManager Configuration

In order to focus on the specific configurations needed, assume that you have a central site named HQ. HQ is where the Cisco CallManager server is. You also have one remote site named Remote. The MoH server is configured on the Cisco CallManager itself at the central site.

Note: Media Resource Group configuration and Media Resource Group Lists configuration in Cisco CallManager is beyond the scope of this document. For the purpose of this document, the default SampleAudioSource is used as an audio source.

These steps are required:

1. Create three regions called HQ, Remote, and MoH.
2. Specify the codecs for each region.
3. Create three device pools called HQ_DP, Remote_DP, and MoHServer_DP.
4. Specify the region that corresponds to each device pool. For example, the region for device pool 'HQ_DP' is 'HQ'.
5. Place the IP phones in their equivalent device pool. For example, at the HQ, IP phones are placed in the HQ_DP device pool.
6. Place the MoH server in the MoHServer_DP device pool.
7. Ensure that the correct codecs are selected in the supported MoH codecs in the Cisco IP Voice Media Streaming application.

Step 1: Create the MoH, HQ, and Remote Regions

Select **System > Region > Add a New Region** in order to create each of these regions:

- MoH
- HQ
- Remote

Step 2: Specify the Codecs for Each Region

For the MoH region, specify these codecs:

- Default: **G.711**
- HQ: **G.711**
- MoH (Within this Region): **G.711**
- Remote: **G.711**

Region Configuration

[Add a New Region](#)
[Back to Find/List Regions](#)
[Dependency Records](#)

Region: MoH

Status: Ready

Region Information

Region Name*

Call Information

The maximum audio codec/video bandwidth supported within this region and between 3 other regions are:

Region	Audio Codec	Video Call Bandwidth
Default	<input type="text" value="G.711"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value=""/> kbps
HQ	<input type="text" value="G.711"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value=""/> kbps
MoH (Within this Region)	<input type="text" value="G.711"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value=""/> kbps
Remote	<input type="text" value="G.711"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value=""/> kbps

For the HQ region, specify these codecs:

- Default: **G.729**
- HQ (Within this Region): **G.729**
- MoH : **G.711**
- Remote: **G.729**

Region Configuration

[Add a New Region](#)
[Back to Find/List Regions](#)
[Dependency Records](#)

Region: HQ

Status: Ready

Region Information

Region Name*

Call Information

The maximum audio codec/video bandwidth supported within this region and between 3 other regions are:

Region	Audio Codec	Video Call Bandwidth
Default	<input type="text" value="G.729"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value="384"/> kbps
HQ (Within this Region)	<input type="text" value="G.729"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value="384"/> kbps
MoH	<input type="text" value="G.711"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value=""/> kbps
Remote	<input type="text" value="G.729"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value="384"/> kbps

For the Remote region, specify these codecs:

- Default: **G.729**
- HQ: **G.729**
- MoH: **G.711**
- Remote (Within this Region): **G.729**

Region Configuration

[Add a New Region](#)
[Back to Find/List Regions](#)
[Dependency Records](#)

Region: Remote
 Status: Ready

Region Information

Region Name*

Call Information

The maximum audio codec/video bandwidth supported within this region and between 3 other regions are:

Region	Audio Codec	Video Call Bandwidth
Default	<input type="text" value="G.729"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value="384"/> kbps
HQ	<input type="text" value="G.729"/>	<input type="radio"/> None <input checked="" type="radio"/> <input type="text" value="384"/> kbps
MoH	<input type="text" value="G.711"/>	<input type="radio"/> None <input type="radio"/> <input type="text"/> kbps
Remote (Within this Region)	<input type="text" value="G.729"/>	<input checked="" type="radio"/> None <input type="radio"/> <input type="text" value="384"/> kbps

Step 3: Create the HQ_DP, Remote_DP, and MoHServer_DP Device Pools

Select **System > Device Pool > Add a New Device Pool** in order to create these three device pools:

- HQ_DP
- Remote_DP
- MoHServer_DP

Step 4: Specify the Region that Corresponds to each Device Pool

For the MoHServer_DP device pool, specify **MoH** as the region.

Device Pool Configuration

[Add new Device Pool](#)
[Back to Find/List Device Pools](#)
[Dependency Records](#)

Device Pool: MoHServer_DP (1 members**)

Status: Ready

[Copy](#) [Update](#) [Delete](#) [Reset Devices](#)

Device Pool Settings

Device Pool Name*	MoHServer_DP
Cisco CallManager Group*	Default
Date/Time Group*	CMLocal
Region*	MoH
Softkey Template*	— Not Selected — Default HQ MoH Remote
SRST Reference*	MoH
Calling Search Space for Auto-registration	Remote
Media Resource Group List	< None >
Network Hold MOH Audio Source	1 - SampleAudioSource
User Hold MOH Audio Source	1 - SampleAudioSource
Network Locale	< None >
User Locale	< None >

Multilevel Precedence and Preemption (MLPP) Information

Note: The default SampleAudioSource is used as an audio source that is used by the MoH server.

For the HQ_DP device pool, specify **HQ** as the region.

Device Pool Configuration

[Add new Device Pool](#)
[Back to Find/List Device Pools](#)
[Dependency Records](#)

Device Pool: HQ_DP (1 members**)

Status: Ready

[Copy](#) [Update](#) [Delete](#) [Reset Devices](#)

Device Pool Settings

Device Pool Name*	HQ_DP
Cisco CallManager Group*	Default
Date/Time Group*	CMLocal
Region*	HQ
Softkey Template*	— Not Selected — Default HQ MoH Remote
SRST Reference*	HQ
Calling Search Space for Auto-registration	MoH
Media Resource Group List	< None >
Network Hold MOH Audio Source	1 - SampleAudioSource
User Hold MOH Audio Source	1 - SampleAudioSource
Network Locale	< None >
User Locale	< None >

Multilevel Precedence and Preemption (MLPP) Information

For the Remote_DP device pool, specify **Remote** as the region.

Device Pool Configuration

[Add new Device Pool](#)
[Back to Find/List Device Pools](#)
[Dependency Records](#)

Device Pool: **Remote_DP** (1 members*+)

Status: **Ready**

[Copy](#) [Update](#) [Delete](#) [Reset Devices](#)

Device Pool Settings

Device Pool Name*	Remote_DP
Cisco CallManager Group*	Default
Date/Time Group*	CMLocal
Region*	Remote
Softkey Template*	— Not Selected —
SRST Reference*	Default
Calling Search Space for Auto-registration	HQ
Media Resource Group List	MoH
Network Hold MOH Audio Source	Remote
User Hold MOH Audio Source	< None >
Network Locale	1 - SampleAudioSource
User Locale	1 - SampleAudioSource
	< None >
	< None >

Multilevel Precedence and Preemption (MLPP) Information

Step 5: Place the IP Phones in the Equivalent Device Pool

Based on the assumption that you have IP Communicator at the Remote region and a Cisco 7960 IP phone at the HQ region, place the IP Communicator in device pool **Remote_DP**.

Phone Configuration (Model = Cisco IP Communicator)

Device Information

MAC Address*	000D608ADAE2
Description	SEP000D608ADAE2
Owner User ID	<input type="text"/> (Select User ID)
Device Pool*	Remote_DP (View details)
Calling Search Space	Default
AAR Calling Search Space	HQ_DP
Media Resource Group List	MoHServer_DP
User Hold Audio Source	Remote_DP
Network Hold Audio Source	< None >
Location	< None >
User Locale	< None >

Place the Cisco 7960 in **HQ_DP**.

Phone Configuration (Model = Cisco 7960)	
Device Information	
MAC Address*	000BBEF9E85E
Description	SEP000BBEF9E85E
Owner User ID	<input type="text"/> (Select User ID)
Device Pool*	HQ_DP (View details)
Calling Search Space	Default
AAR Calling Search Space	MoHServer_DP
Media Resource Group List	< None >
User Hold Audio Source	< None >
Network Hold Audio Source	< None >
Location	< None >
User Locale	< None >
Network Locale	< None >
Device Security Mode	Use System Default

Step 6: Place the MoH Server in the MoHServer_DP Device Pool

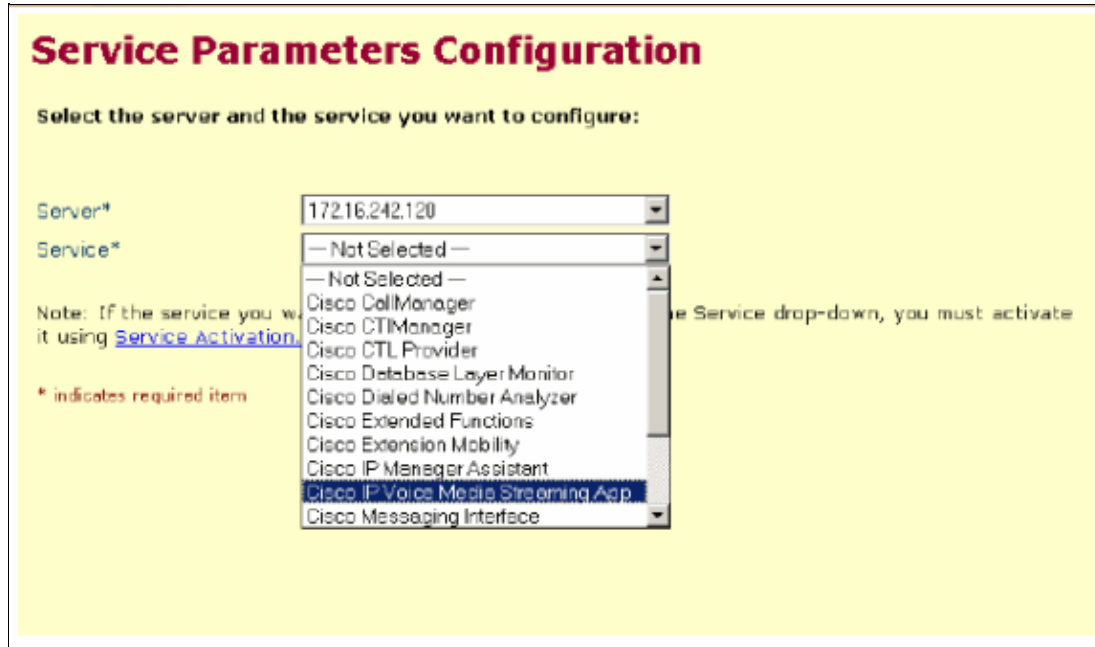
Select **Service > Media Resource** and select the MoH server.

In the Device Pool field select **MoHServer_DP**.

Music On Hold (MOH) Server Configuration	
Add a New Music On Hold Server Configure Audio Sources Trace Configuration Back to Find/List Music On Hold Servers Dependency Records	
Music On Hold Server: MOH_172.16.242. (MOH_172.16.242.) Registration: Registered with Cisco CallManager 172.16.242.120 IP Address: 172.16.242.120 Status: Ready <input type="button" value="Copy"/> <input type="button" value="Update"/> <input type="button" value="Delete"/> <input type="button" value="Reset"/>	
Device Information	
Host Server	172.16.242.120
Music On Hold Server Name*	MOH_172.16.242.
Description	MOH_172.16.242.
Device Pool*	MoHServer_DP
Location	-- Not Selected --
Maximum Half Duplex Streams*	Default
Maximum Multicast Connections*	MoHServer_DP
Fixed Audio Source Device	Remote_DP

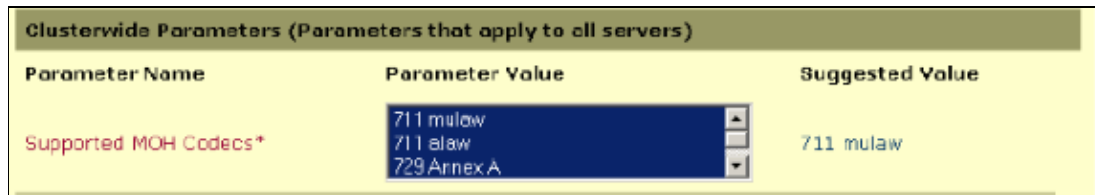
Step 7: Ensure that the Correct Codecs are Selected in the Supported MoH Codecs in Cisco IP Voice Media Streaming Application

Select **Service > Service Parameters** and choose **Cisco IP Voice Media Streaming App** from the Service pull down menu.



Under Clusterwide Parameters, select the codecs that you want supported for MoH.

Although G.729 is selected here, you only need G.711. When you select multiple codecs, hold down the CTRL key and use the mouse to select multiple codecs from the list.



Verify

Place a call from the Cisco 7960 to the IP Communicator. Once the call is answered, double-click the ? in the IP Communicator screen to view Call Statistics.

Note: The codec used here is G.729.



From the Cisco 7960, place the user (IP Communicator phone) on hold and view Call Statistics.

Note: The codec is now G.711. This is used for the MoH transmission:



Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

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NetPro Discussion Forums – Featured Conversations for Voice
Service Providers: Voice over IP
Voice & Video: Voice over IP
Voice & Video: IP Telephony
Voice & Video: IP Phone Services for End Users
Voice & Video: Unified Communications
Voice & Video: IP Phone Services for Developers
Voice & Video: General

Related Information

- **Voice Technology Support**
 - **Voice and Unified Communications Product Support**
 - **Recommended Reading: Troubleshooting Cisco IP Telephony**
 - **Technical Support – Cisco Systems**
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