

H.323 Gateway Configuration Between CallManager Express and CallManager

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Introduction

This document provides a sample configuration of the deployment of Cisco Unified CallManager Express (Cisco Unified CME) for branch offices in conjunction with a Cisco Unified CallManager deployed at a central office site. In this situation, the central Cisco Unified CallManager site can communicate with the remote CME with a H.323 gateway. In H.323 networks, Cisco Unified CME provides supplementary service interworking (H.450) with Voice over IP (VoIP) hairpin call routing when needed for intersite call transfer and forwarding.

Note: Direct MGCP integration between Cisco Unified CME IP phones and Cisco Unified CallManager is not supported.

Prerequisites

Requirements

Ensure that you meet these requirements before you attempt this configuration:

- Knowledge of Cisco Unified Communications Manager (CallManager)
- Basic knowledge of Cisco Unified CME

Components Used

The information in this document is based on these software and hardware versions:

- Cisco Unified Communications Manager: **4.1(3)SR3b**
- CallManager Express: Cisco IOS® **12.4(9)T2**, **CME Version 4.0(0)**

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

Refer to the Cisco Technical Tips Conventions for more information on document conventions.

H.323 with CME

Both Cisco Unified CallManager and Cisco Unified CME support H.323, which you can use to create Cisco Unified CallManager-to-Cisco Unified CME links. Cisco Unified CME also supports SIP for VoIP interconnect. SIP has also been introduced as a WAN trunking interface on Cisco Unified CallManager. This document focuses only on the H.323 interconnect option. The information contained in this document applies to the Cisco Unified CME 3.1 and 3.2 releases and the Cisco Unified CallManager 3.3(3) and 4.0. Newer versions can have different behaviors and options than those described here.

Creation of a New CME Site

Create New Region

When you create a new CME site, it can require a new **region** (for Codec selection), a new **location** (for bandwidth control), and a new **device pool**. Some sites can also create local **media resources**. In this section, you are presented with the information to configure the features described in this document.

In order to create a new region, go to **System > Region** from the Cisco Unified Communication Manager Administration page.

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

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Region Configuration

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

Region: New
Status: Ready

Region Name*

Default Codec with Other Regions

* indicates required item

In the Region Name field, enter the name that you want to assign to the new region. Choose a value from the drop-down list box for the default codec to use between this region and other regions. Click **Insert**.

In the Audio Codec column, use the drop-down list boxes to choose the audio codec to use for calls within the new region and between the new region and existent regions. The audio codec determines the type of compression and the maximum amount of bandwidth that is allocated for these calls.

Add New Location

This section describes how to add a new location to the Cisco CallManager database. Use locations to implement call admission control in a centralized call-processing system. Call admission control enables you to regulate audio quality and video availability because it limits the amount of bandwidth that is available for audio and video calls over links between the locations.

Perform the procedure below to add a new location.

1. Choose **System > Location**.
2. In order to add a location, use one of these methods:
 - ◆ If a location already exists with settings that are similar to the one that you want to add, choose the existent location to display its settings. Click **Copy**, and modify the settings as needed.
 - ◆ In order to add a location without the need to copy an existent one, continue with Step 3.
3. In the upper, right corner of the window, click the **Add a New Location** link. Enter the appropriate settings.
4. In order to save the location information in the database, click **Insert**.

The screenshot displays the Cisco CallManager Administration web interface for 'Location Configuration'. At the top, there is a navigation menu with options: System, Route Plan, Service, Feature, Device, User, Application, and Help. The page title is 'Cisco CallManager Administration For Cisco IP Telephony Solutions'. The main heading is 'Location Configuration', with links for 'Add a New Location' and 'Back to Find/List Locations'. The configuration form is titled 'Location: New' and shows a status of 'Ready'. A red arrow points to the 'Insert' button. The form includes several sections: 'Location Information' with a text field for 'Location Name*' containing 'C1101_CNShLB'; 'Audio Calls Information' with a radio button for 'Unlimited' and a text field for 'Audio Bandwidth*' set to '288 kbps'; and 'Video Calls Information' with radio buttons for 'None' and 'Unlimited', and a text field for 'Video Bandwidth*' set to '384 kbps'. A note at the bottom indicates '* indicates required item'.

Note: When calls cannot use the link for a location, it is possible that bandwidth leakage has occurred that can reduce the allotted bandwidth for the location. You can resynchronize the location bandwidth to the maximum amount that is assigned to this location without the need to reset the Cisco CallManager server. Find the location and click **ReSync Bandwidth** to resynchronize the bandwidth for the chosen location.

Create New Device Pool

Use the Device Pool Settings to define sets of common characteristics for devices such as the Date/Time Group, Region, SRST Reference, Media Resource Group List, etc.

Follow this procedure to add a new device pool.

1. Choose **System > Device Pool**.
2. Use one of these methods to add a device pool:
 - ◆ If a device pool already exists with settings that are similar to the one that you want to add, choose the existent device pool to display its settings; click **Copy**, and modify the settings, as needed.
 - ◆ In order to add a device pool without copying an existent one, continue with Step 3.
3. In the upper right corner of the window, click the **Add a New Device Pool** link.

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

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

Device Pool: New
Status: Ready

Device Pool Settings

Device Pool Name*	C1101_CNSHLB_DP
Cisco CallManager Group*	APCN01_DP_A
Date/Time Group*	CMLocal
Region*	C1101_CNSHLB
Softkey Template*	Standard User
SRST Reference*	Disable
Calling Search Space for Auto-registration	< None >
Media Resource Group List	APCN01_MRGL
Network Hold MOH Audio Source	< None >
User Hold MOH Audio Source	< None >
Network Locale	< None >
User Locale	< None >
Connection Monitor Duration***	120

Multilevel Precedence and Preemption (MLPP) Information

MLPP Indication*	Default
MLPP Preemption*	Default
MLPP Domain (e.g., *0000FF*)	

* indicates required item
** number of devices that have to be reset when this device pool gets updated. To see a detailed list of these devices and other dependencies, click on Dependency Records.
*** leave blank to use default.

4. Enter or edit the appropriate fields and click **Insert** to save the device pool information in the database.

Note: If the local IPT gateway provides DSP (Transcoding or Conferencing) services to local devices, they must also be configured with Media Resources , MRG, and MRGL.

Add Gateway to CallManager

Before you add the gateway, you need to check the interface IP address used by the CME router. Issue these commands in the CME Router to validate the IP address in use by the IOS Telephony–Service.

```
CMErouter#sh telephony-service | inc ^ip
ip source-address 10.252.107.5 port 2000
```

This gateway uses 10.252.107.5 as the IP address.

Inspect which interfaces use the above IP address, as well as the status of the interfaces.

```
CMERouter#sh ip int brief | inc 10.252.107.5
Service-Engine0/0      10.252.107.5      YES TFTP      up
Loopback1              10.252.107.5      YES TFTP      up
```

Note: The **Service–Engine 0/0** slot in use by Cisco Unity Express runs in the Unnumbered mode.

In order to learn more information about the interface service–engine 0/0, use this command.

```
CMERouter#show running intferace service-engine0/0
!
interface Service-Engine0/0
 ip unnumbered Loopback1
 service-module ip address 10.252.107.6 255.255.255.252
 service-module ip default-gateway 10.252.107.5
end
```

Create Gateway from CallManager Administration Page

Follow this procedure to create a H.323 gateway.

1. In order to create a H.323 gateway from the CallManager Administration page, choose **Device> Gateway**Click **Add a New Gateway**.

System Route Plan Service Feature Device User Application Help

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Find and List Gateways [Add a New Gateway](#)

1 matching record(s) for Device Name begins with ""

Find gateways where Device Name begins with Find
and show 20 items per page. Hide endpoints. Enter search text above

To list all items, click Find without any search text, or use "Device Name is not empty" as the search criteria.

Matching record(s) 1 to 1 of 1
Real-time Information Service returned information for 1 of 1 devices listed below.

<input type="checkbox"/>	Device Name	Description	Device Pool	Status	IP Address
<input checked="" type="checkbox"/>	172.21.0.2	VG	C1001_APCN01_DP	Unknown	172.21.0.2

Delete Selected Reset Selected First Previous Next Last Page 1 of 1

2. Choose **H.323 Gateway** and click **Next**.

Add a New Gateway

Select the type of gateway you would like to create:

Gateway type* H.323 Gateway
Device Protocol* H.225

* indicates required item

Next

3. Enter a unique name for the Cisco CallManager to use to identify the device. Use either the IP address or the host name as the device name. The new Gateway needs to use distinct site settings, such as Device Pool or Location.

Gateway Configuration

[Back to Find/List Gateways](#)
[Dependency Records](#)

Product : H.323 Gateway
Gateway : 10.252.107.5
Device Protocol: H.225
Registration: Unknown
IP Address:

Status: Ready 

Device Information

Device Name*	10.252.107.5
Description	shanghai1ab1
Device Pool*	C1101_CNHLB_DP
Call Classification*	OnNet
Media Resource Group List	APCN01_MRGL
Location	C1101_CNHLB28
AAR Group	< None >
Tunneled Protocol	< None >
Signaling Port*	1720
<input type="checkbox"/> Media Termination Point Required	
<input checked="" type="checkbox"/> Retry Video Call as Audio	
<input checked="" type="checkbox"/> Wait for Far End H.245 Terminal Capability Set	
<input type="checkbox"/> Path Replacement Support	

Multilevel Precedence and Preemption (MLPP) Information

MLPP Domain (e.g., "0000FF")	
MLPP Indication	Not available on this device
MLPP Preemption	Not available on this device

Call Routing Information

Inbound Calls

Significant Digits*	All
Calling Search Space	COS1_Phone_CSS
AAR Calling Search Space	< None >
Prefix DN	
<input type="checkbox"/> Redirecting Number IE Delivery - Inbound	
<input type="checkbox"/> Enable Inbound FastStart	

Outbound Calls

Calling Party Selection*	Originator
Calling Party Presentation*	Default
Called party IE number type unknown*	Cisco CallManager
Calling party IE number type unknown*	Cisco CallManager
Called Numbering Plan*	Cisco CallManager
Calling Numbering Plan*	Cisco CallManager
Caller ID DN	
<input type="checkbox"/> Display IE Delivery	
<input type="checkbox"/> Redirecting Number IE Delivery - Outbound	
<input type="checkbox"/> Enable Outbound FastStart	

Note: After all configuration settings are validated, the H.323 gateway should be Updated and Reset.

Create Route Group for Gateway

Follow this procedure to create a new route group for the new H.323 gateway.

1. In order to create a new route group for the new H.323 gateway, choose **Route Plan > Route/Hunt > Route Group**.

The screenshot displays the Cisco CallManager Administration interface for configuring a new Route Group. The page title is "Route Group Configuration". The navigation menu includes System, Route Plan, Service, Feature, Device, User, Application, and Help. The Cisco logo and "Cisco CallManager Administration For Cisco IP Telephony Solutions" are visible at the top. The main content area is titled "Route Group: New" and shows the following configuration details:

- Status:** Ready
- Insert** button (highlighted with a red arrow)
- Route Group Information:**
 - Route Group Name*:** C1101_CNSHLB_RG (circled in red)
 - Distribution Algorithm*:** Circular
- Route Group Member Information:**
 - Find Devices to Add to Route Group:** Device Name contains [] Find
 - Available Devices:** 10.252.107.5, 172.21.0.2
 - Port(s):** None Available [v] Add to Route Group
- Current Route Group Members:**
 - Reverse Order of Selected Devices** button (highlighted with a red arrow)
 - Selected Devices*:** 10.252.107.5 (All Ports) (circled in red)
 - Removed Devices:** (to be removed from Route Group when you click Update)

* indicates required item

2. Assign a new name for the **Route Group** and add the H.323 gateway to the route group.

Create Call Routing for New Pattern

Call Routing Build Order

The order in which to add the call routing is this:

1. Gateway
2. Route Group
3. Route List
4. Route Pattern

Add New Route List

Follow this procedure to create a new route list for the new dial pattern.

1. In order to create a new route list for the new dial pattern, choose **Route Plan > Route/Hunt > Route List**.
2. Click **Add a New Route List**.

Use concise and descriptive names for your route lists. The CompanynameLocationCalltype format usually provides a sufficient level of detail and is short enough to enable you to quickly and easily identify a route list.

The screenshot displays the Cisco CallManager Administration interface for configuring a new route list. The page title is "Route List Configuration". The main content area shows "Route List: New" with a status of "Ready" and an "Insert" button highlighted by a red arrow. Below this is the "Route List Information" section with the following fields:

Route List Name*	C1101_CNHLB_RL
Description	Shanghai Labs
Cisco CallManager Group*	APCN01_DP_A

* indicates required item

Note: Two route groups are associated with this route list: one for OnNet calls from the H.323 gateway to the CME router and another for OffNet calls to the CME router through PSTN. OffNet calls need to translate the called number to use the PSTN circuits.

The route list details that are associated with the Failover route group look like this with the calling-party and called-party transformations.

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Route List Detail Configuration

[Add a new Route List](#)
[Configure Route Group \(APCN_RG01\)](#)
[Back to Route List Configuration](#)
[Back to Find/List Route Lists](#)

Route List Details

- C1101_CNSHLB_RG
- APCN_RG01**

Route List: C1101_CNSHLB_RL
Route Group: APCN_RG01

Status: Ready

The settings on this page override the settings of the same name on the Route Pattern page. These settings are used for calls routed through this member of the current Route List only.

Details for APCN_RG01

Calling Party Transformations

Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Called Party Transformations

Dial Plan*

Discard Digits
(Using North American Numbering Plan)

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

* indicates required item

Add New Route Pattern

Follow this procedure to add a new route pattern.

1. In order to add a new route pattern, choose **Route Plan > Route/Hunt > Route Pattern** from the CallManager Administration page.
2. Click **Add a New Route Pattern**.

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Route Pattern Configuration

[Add a New Route Pattern](#)
[Back to Find/List Route Patterns](#)

Route Pattern: New
Status: Ready
Note: Any update to this Route Pattern automatically resets the associated gateway or Route List



Pattern Definition

Route Pattern*
 Partition
 Description
 Numbering Plan*
 Route Filter
 MLPP Precedence
 Gateway or Route List*
 Route Option Route this pattern
 Block this pattern
 Call Classification* Allow Device Override
 Provide Outside Dial Tone Allow Overlap Sending Urgent Priority
 Require Forced Authorization Code
 Authorization Level
 Require Client Matter Code

Calling Party Transformations

Use Calling Party's External Phone Number Mask
 Calling Party Transform Mask
 Prefix Digits (Outgoing Calls)
 Calling Line ID Presentation
 Calling Name Presentation

Connected Party Transformations

Connected Line ID Presentation
 Connected Name Presentation

Called Party Transformations

Discard Digits
 Called Party Transform Mask
 Prefix Digits (Outgoing Calls)

ISDN Network-Specific Facilities Information Element

Carrier Identification Code
 Network Service Protocol
 Network Service Service Parameter Name Service Parameter Value

* indicates required item.

Note: Make sure the route pattern is in an appropriate partition and any needed Calling Search Spaces (CSS). In this example, we put the route pattern in the same partition as the phones so that no additional CSS configuration is required to make this pattern reachable.

Verify

This section of the document explains how verify the details of active calls and dial-peers.

Verification on CME

Use this section to confirm that your configuration works properly.

Verify the dial-peer configured on the CME.

```
shanghai1abl#sh dial-peer voice summary | inc 5678
```

TAG	TYPE	MIN	OPER	PREFIX	DEST-PATTERN	PRE	PASS	THRU	SESS-TARGET	OUT	STAT	PORT
5000	voip	up	up		[5678]..	1	syst	ipv4:172.21.21.21				
5001	pots	up	up		[5678]..	2					up	0/2/0
5003	pots	up	up		[5678]..	4					up	0/2/2
5004	pots	up	up		[5678]..	5					up	0/2/3
5002	pots	up	up		[5678]..	3					up	0/2/1

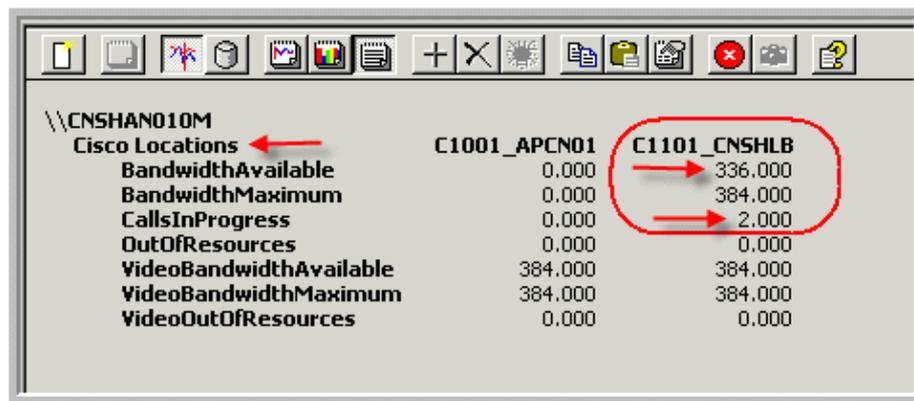
Note: Make sure that the VoIP dial-peer session target points to the CallManager IP address.

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

Check CallManager for Call Admission Control

Check the CallManager for Call Admission Control (CAC) through the locations parameter. Verify that Call Admission Control monitors the bandwidth in use.

Go to **Start > Programs > Administrative Tool > Performance > Cisco CallManager > Location.**



Troubleshoot

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

Related Information

- [How to apply CAC based on CPU & Memory Utilization to prevent gateway overload](#)
- [Voice Technology Support](#)
- [Voice and Unified Communications Product Support](#)
- [Troubleshooting Cisco IP Telephony](#)

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