

Understand Media Resource Groups and Group Lists

Document ID: 45525

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Introduction

Since the release of Cisco CallManager 3.1x, Media Resource Groups (MRGs) and Media Resource Group Lists (MRGLs) are now used in order to allow an administrator to allocate media resources to particular devices. The most common use of MRGs and MRGLs is to restrict media resource usage on a geographic basis. For example, if you have conference resources at a remote location, you can create an MRGL for the IP phones at the remote location that only allows them to access their local conference bridge resources. This ensures that the conference calls that an IP phone creates at the remote location do not have to use WAN bandwidth for conferencing within the same site. You can also configure the MRGL to have secondary, tertiary resources (and so forth), so that if the conference bridge at a remote location is out of resources or is unavailable, resources from another site can be used as a backup. You can use MRGs and MRGLs for any other media resource (for instance, Music On Hold Servers (MOH), and Transcoding resources).

Prerequisites

Requirements

Cisco recommends that you have knowledge of Cisco CallManager Fundamentals.

Components Used

The information in this document is based on Cisco CallManager 3.1x and later.

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.

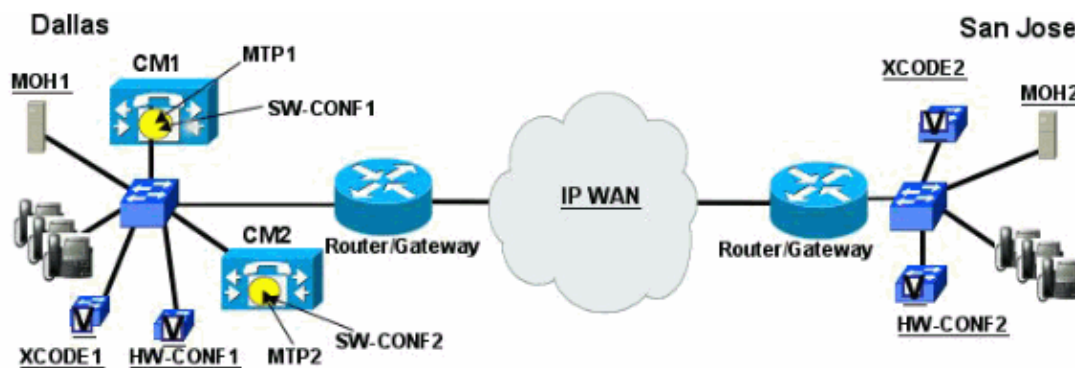
Conventions

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

Media Resource Groups and Media Resource Group Lists

An MRGL provides a prioritized grouping of MRGs. An application selects the required media resource, such as an MOH server, from among the available media resources based on the priority order defined in an MRGL.

Media resource management provides access to media resources for all Cisco CallManagers in a cluster. Every Cisco CallManager contains a software component called a Media Resource Manager. The Media Resource Manager locates the necessary media resource in order to connect media streams to complete a feature (for example, MOH, Conferencing, and so forth). The Cisco CallManager uses the Skinny protocol in order to interface to these media resources.



- CM1 and CM2 belong to the same cluster.
- Cisco CallManager uses the MRGL concept in order to select resources. The selection depends on the geographical assignment of the resources.

The Media Resource Manager

The Media Resource Manager manages these media resource types:

- MOH server.
- Unicast conference bridge (CFB).
- Media streaming application server (software media termination point).
- Transcoder (XCODE).

These reasons explain why resources are shared:

- In order to allow both hardware and software devices to coexist within a Cisco CallManager.
- In order to enable Cisco CallManager to share and access resources available within the cluster.
- In order to enable Cisco CallManager to perform load distribution within a group of similar resources.
- In order to enable Cisco CallManager to allocate resources based on user preferences.

Initialization of Cisco CallManager creates a Media Resource Manager. Each Media Termination Point, MOH, Transcoder, and Conference Bridge device defined in the database registers with the Media Resource Manager. The Media Resource Manager obtains a list of provisioned devices from the database and constructs and maintains a table in order to track these resources. The Media Resource Manager uses this table in order to validate registered devices. The Media Resource Manager keeps track of the total devices available in the

system. The Media Resource Manager also tracks the devices that have available resources.

When a media device registers, Cisco CallManager creates a controller in order to control this device. After the device is validated, the system advertises its resources throughout the cluster. This mechanism allows the resource to be shared throughout the cluster.

Resource reservation takes place based on search criteria. The given criteria provide the resource type and the MRGL. When the Cisco CallManager no longer needs the resource, resource deallocation occurs. Cisco CallManager updates and synchronizes the resource table after each allocation and deallocation.

Media Resource Manager Interfaces

The Media Resource Manager interfaces with these major components:

- Call Control
- Media Control
- Media Termination Point Control
- Unicast Bridge Control
- MOH Control

The Call Control software component performs call processing, this includes setup and tear down of connections. Call Control interacts with the feature layer in order to provide services like transfer, hold, conference, and so forth. Call Control interfaces with the Media Resource Manager when it needs to locate a resource in order to set up a conference call and/or MOH features.

The Media Control software component manages the creation and teardown of media streams for the endpoint. Whenever a request for media to be connected between devices is received, Media Control sets up the proper interface in order to establish a stream, which depends on the type of endpoint.

The media layer interfaces with the Media Resource Manager when it needs to locate a resource in order to set up a Media Termination Point. Media Termination Point Control provides the capability to bridge an incoming H.245 stream to an outgoing H.245 stream. Media Termination Point maintains an H.245 session with an H.323 endpoint when the streaming from its connected endpoint stops. Media Termination Point currently supports only codec G.711 and can also transcode a-law to mu-law.

For each Media Termination Point device defined in the database, Cisco CallManager creates a Media Termination Point Control process. This Media Termination Point Control process registers with the Media Resource Manager when it initializes. The Media Resource Manager keeps track of these Media Termination Point resources and advertises their availability throughout the cluster.

Unicast Bridge Control provides the capability to mix a set of incoming unicast streams into a set of composite output streams. Unicast Bridge provides resources in order to implement ad hoc and meet-me conferencing in the Cisco CallManager. For each Unicast Bridge device defined in the database, Cisco CallManager creates a Unicast Control Process. This Unicast Control Process registers with the Media Resource Manager when it initializes. The Media Resource Manager tracks Unicast stream resources and advertises their availability throughout the cluster.

MOH provides the capability to redirect a party on hold to an audio server. For each MOH server device defined in the database, Cisco CallManager creates an MOH control process. This MOH Control Process registers with the Media Resource Manager when it initializes. The Media Resource Manager tracks MOH resources and advertises their availability throughout the cluster. MOH supports both Unicast and Multicast audio sources.

Configure Media Resource Groups/Media Resource Group Lists

- MRGs are logical groupings of media resources. A single MRG can contain hardware conference resources, software conference resources, transcoder resources, MOH servers, and software Media Termination Points. An MRG has no user-defined order. All resources in an MRG are considered equal. Therefore, Cisco CallManager loads share between resources of each type in one MRG.
- When transcoding is used with a conference, the transcoder is selected based on the MRGL of the Conference Bridge.

Note: You cannot explicitly configure an MRGL for a Conference Bridge. Therefore, the MRGL is taken first from the Device Pool, and then from the MRG default pool.

- When a phone is put on hold, the MRGL of the device that it put on hold (could be a gateway for offnet calls) determines which MOH server is used to play music to the held device.
- Conference Bridges are chosen based on the MRGL of the conference controller (the party that initiates the conference).
- If a call goes out through a gateway, and Media Termination Point (MTP) is required. The MRGL of the gateway is then used to select the MTP.
- MRGLs are an ordered list of MRGs. All resources in one MRG must be exhausted before Cisco CallManager attempts to use a media resource from another MRG in the same MRGL.
- MRGLs can be associated on a per-device basis, which means that you can give specific devices access to media resources on an individual basis. A second MRGL can also be configured at the device pool level.
 - ◆ If a device has an MRGL configured at the device pool level as well as on the device itself, the MRGL configured at the device level is searched first, followed by the MRGL on the device pool.
- The last MRGL is the default MRGL. A media resource that is not assigned to an MRG is automatically assigned to the default MRGL. The default MRGL is always searched and it is the last resort if no resources are available in the device-based MRGL and the device pool MRGL or if no MRGLs are configured at any level.

Configuration Procedure

Complete these steps in order to configure your MRG/MRGLs after you have your media resources configured within Cisco CallManager.

1. Login to the Cisco CallManager Administration page and select **Service > Media Resource > Media Resource Group**.



2. Select **Add a New Media Resource Group**.



A list of all the configured media resources displays.

System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
For Cisco IP Telephony Solutions

CISCO SYSTEMS

Media Resource Group Configuration

[Add a New Media Resource Group](#)
[Back to Find/List Media Resource Groups](#)

Media Resource Group: New
Status: Ready

Media Resource Group Information

Media Resource Group Name*

Description

Devices for this Group

Available Media Resources
Includes Conference Bridges (CFB),
Media Termination Points (MTP),
Music On Hold Servers (MOH),
and Transcoders (XCODE)

CFB_14.48.26.11 (CFB)	▲
CFB_14.48.26.12 (CFB)	
MOH_14.48.26.11 (MOH)	
MOH_14.48.26.12 (MOH)	
MTP_14.48.26.11 (MTP)	▼

▼ ▲

Selected Media Resources*

Use Multicast for MOH Audio (requires at least one multicast MOH resource)

* indicates required item

3. Enter a name for the MRGs. Select the resources that you want to associate with this MRG and then click **Insert**.

Note: In this example, two MRGs are created. One for Main Site resources and one for Remote Site resources.

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For Cisco IP Telephony Solutions

[Add a New Media Resource Group](#)
[Back to Find/List Media Resource Groups](#)

Media Resource Group Configuration

Media Resource Group: New
Status: Ready

Media Resource Group Information

Media Resource Group Name*

Description

Devices for this Group

Available Media Resources
Includes Conference Bridges (CFB),
Media Termination Points (MTP),
Music On Hold Servers (MOH),
and Transcoders (XCODE)

CFB_14.48.26.12 (CFB)
MOH_14.48.26.12 (MOH)
MTP_14.48.26.12 (MTP)
MTP_14.48.26.11 (MTP)

Selected Media Resources*

CFB_14.48.26.11 (CFB)
MOH_14.48.26.11 (MOH)

Use Multicast for MOH Audio (requires at least one multicast MOH resource)

* indicates required item

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For Cisco IP Telephony Solutions

[Add a New Media Resource Group](#)
[Back to Find/List Media Resource Groups](#)

Media Resource Group Configuration

Media Resource Group: New
Status: Ready

Media Resource Group Information

Media Resource Group Name*

Description

Devices for this Group

Available Media Resources
Includes Conference Bridges (CFB),
Media Termination Points (MTP),
Music On Hold Servers (MOH),
and Transcoders (XCODE)

CFB_14.48.26.12 (CFB)
MOH_14.48.26.12 (MOH)
MTP_14.48.26.12 (MTP)

Selected Media Resources*

CFB_14.48.26.11 (CFB)
MOH_14.48.26.11 (MOH)
MTP_14.48.26.11 (MTP)

Use Multicast for MOH Audio (requires at least one multicast MOH resource)

* indicates required item

4. Create another MRG for the remote site resources. In this example, a copy is made of the first group and the Name is changed to reflect the new group.

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Media Resource Group Configuration

[Add a New Media Resource Group](#)
[Back to Find/List Media Resource Groups](#)

Media Resource Group: New (Copy of Dallas_MRG)
Status: Ready

Media Resource Group Information

Media Resource Group Name*

Description

Devices for this Group

Available Media Resources
Includes Conference Bridges (CFB),
Media Termination Points (MTP),
Music On Hold Servers (MOH),
and Transcoders (XCODE)

MTP_14.48.26.12 (MTP)
CFB_14.48.26.11 (CFB)
MOH_14.48.26.11 (MOH)
MTP_14.48.26.11 (MTP)

Selected Media Resources*

CFB_14.48.26.12 (CFB)
MOH_14.48.26.12 (MOH)

Use Multicast for MOH Audio (requires at least one multicast MOH resource)

* indicates required item

5. Select all the necessary resources and click **Insert**.

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Media Resource Group Configuration

[Add a New Media Resource Group](#)
[Back to Find/List Media Resource Groups](#)

Media Resource Group: New (Copy of Dallas_MRG)
Status: Ready

Media Resource Group Information

Media Resource Group Name*

Description

Devices for this Group

Available Media Resources
Includes Conference Bridges (CFB),
Media Termination Points (MTP),
Music On Hold Servers (MOH),
and Transcoders (XCODE)

CFB_14.48.26.11 (CFB)
MOH_14.48.26.11 (MOH)
MTP_14.48.26.11 (MTP)

Selected Media Resources*

CFB_14.48.26.12 (CFB)
MOH_14.48.26.12 (MOH)
MTP_14.48.26.12 (MTP)

Use Multicast for MOH Audio (requires at least one multicast MOH resource)

* indicates required item

6. Select **Service > Media Resource > Media Resource Group List** in order to create an MRGL to associate the MRG(s).

The screenshot shows the Cisco CallManager configuration interface. At the top, there is a navigation bar with tabs: System, Route Plan, Service, Feature, Device, User, Application, and Help. The 'Service' tab is active, and a dropdown menu is open, showing options: Cisco IPMA Configuration Wizard, Cisco CM Attendant Console, Media Resource, Service Parameters, Conference Bridge, Media Termination Point, Music On Hold Audio Source, Music On Hold Server, Transcoder, Media Resource Group, and Media Resource Group List. The 'Media Resource Group List' option is highlighted with a mouse cursor. In the top right corner, there is a Cisco Systems logo and a link: [New Media Resource Group List Media Resource Groups Dependency Records](#).

Media Resource Group Configuration

Media Resource Group: SanJose_MRG (used by 0 devices)
Status: Insert completed

Copy Update Delete Reset Devices

Media Resource Group Information

Media Resource Group Name*	SanJose_MRG
Description	SanJose_MRG Resources

Devices for this Group

Available Media Resources
Includes Conference Bridges (CFB),
Media Termination Points (MTP),
Music On Hold Servers (MOH),
and Transcoders (XCODE)

CFB_14.48.26.11 (CFB)
MOH_14.48.26.11 (MOH)
MTP_14.48.26.11 (MTP)

Selected Media Resources*

CFB_14.48.26.12 (CFB)
MOH_14.48.26.12 (MOH)
MTP_14.48.26.12 (MTP)

Use Multicast for MOH Audio (requires at least one multicast MOH resource)

* indicates required item

7. Click **Add a New Media Resource Group List**.

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Find and List Media Resource Group Lists

[Add a New Media Resource Group List](#)

No matches were found for Name begins with ""

Find Media Resource Group Lists where Name

and show items per page

To list all items, click Find without entering any search text.

No matching records

8. Four MRGLs are created in this example.

a. MRG Dallas_MRGL for the main site resources.

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Media Resource Group List Configuration

[Add a New Media Resource Group List](#)
[Back to Find/List Media Resource Group Lists](#)

Media Resource Group List: New
Status: Ready

Media Resource Group List Information

Media Resource Group List Name*

Media Resource Groups for this List

Available Media Resource Groups

Dallas_MRG
SanJose_MRG

Selected Media Resource Groups*

(Groups listed in order of priority)

* indicates required item

b. MRG SanJose_MRGL for the remote site resources.

The screenshot displays the Cisco CallManager Administration web interface. At the top, there is a navigation menu with links for System, Route Plan, Service, Feature, Device, User, Application, and Help. The main header includes the Cisco CallManager Administration logo and the Cisco Systems logo. The page title is "Media Resource Group List Configuration".

On the right side, there are two links: "Add a New Media Resource Group List" and "Back to Find/List Media Resource Group Lists".

The main content area shows the configuration for a new Media Resource Group List:

- Media Resource Group List: New**
- Status: Ready
- Insert button
- Media Resource Group List Information**
- Media Resource Group List Name*: Dallas_MRGL
- Media Resource Groups for this List**
- Available Media Resource Groups: SanJose_MRGL
- Selected Media Resource Groups*: Dallas_MRGL
- (Groups listed in order of priority)
- * indicates required item

c. MRG Dallas_Redundant_MRGL for redundancy if the server that the Dallas office devices are honed to goes down. If media resources are not available at this site, they failover to the remote site resources so that calls do not fail.

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Media Resource Group List Configuration

[Add a New Media Resource Group List](#)
[Back to Find/List Media Resource Group Lists](#)

Media Resource Group List: **New (Copy of Dallas_MRGL)**
Status: Ready

Media Resource Group List Information

Media Resource Group List Name*

Media Resource Groups for this List

Available Media Resource Groups

▼ ▲

Selected Media Resource Groups*

(Groups listed in order of priority)

* indicates required item

- d. MRG SanJose_Redundant_MRGL for redundancy if the server that the San Jose office devices are honed to goes down. If media resources are not available at the remote site, they failover to the main site resources so that calls do not fail.
9. For the Dallas_Redundant_MRGL, the Dallas_MRG is first in the list and SanJose_MRG is the second.

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Media Resource Group List Configuration

[Add a New Media Resource Group List](#)
[Back to Find/List Media Resource Group Lists](#)

Media Resource Group List: New (Copy of SanJose_MRGL)
Status: Ready

Insert

Media Resource Group List Information

Media Resource Group List Name* Dallas_Redundant_MRGL

Media Resource Groups for this List

Available Media Resource Groups

Selected Media Resource Groups* Dallas_MRGL
SanJose_MRGL
(Groups listed in order of priority)

* indicates required item

10. For the SanJose_Redundant_MRGL, the SanJose_MRGL is first in the list and Dallas_MRGL is the second.

System Route Plan Service Feature Device User Application Help

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Media Resource Group List Configuration

[Add a New Media Resource Group List](#)
[Back to Find/List Media Resource Group Lists](#)

Media Resource Group List: New (Copy of Dallas_Redundant_MRGL)
Status: Ready

Insert

Media Resource Group List Information

Media Resource Group List Name* SanJose_Redundant_MRGL

Media Resource Groups for this List

Available Media Resource Groups

Selected Media Resource Groups* SanJose_MRGL
Dallas_MRGL
(Groups listed in order of priority)

* indicates required item

11. When you perform a search on **Media Resource Group Lists**, you see all four lists that are created.

The screenshot shows the Cisco CallManager Administration web interface. At the top, there is a navigation menu with links for System, Route Plan, Service, Feature, Device, User, Application, and Help. The main header area includes the Cisco CallManager Administration logo and the Cisco Systems logo. The page title is "Find and List Media Resource Group Lists", with a link to "Add a New Media Resource Group List". Below the title, it indicates "4 matching record(s) for Name begins with """. A search form is present with a dropdown menu set to "begins with", an empty text input field, and a "Find" button. Below the search form, it says "and show 20 items per page" and "To list all items, click Find without entering any search text." The search results are displayed in a table with the following rows:

<input type="checkbox"/>	Media Resource Group List	Copy
<input type="checkbox"/>	Dallas_MRGL	
<input type="checkbox"/>	Dallas_Redundant_MRGL	
<input type="checkbox"/>	SanJose_MRGL	
<input type="checkbox"/>	SanJose_Redundant_MRGL	

At the bottom of the table, there is a "Delete Selected" button. Below the table, there are navigation links: "First Previous Next Last" and "Page 1 of 1".

12. Associate the MRGL with either the Device Pool for all users or through configuration on the device itself.

In this example, the redundant MRGL is configured for both the Dallas Location and San Jose location.

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Device Pool Configuration

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

Device Pool: PubSub_DP (19 members)**
Status: Ready

Copy Update Delete Reset Devices

Device Pool Settings

Device Pool Name*	PubSub_DP
Cisco CallManager Group*	PubSub_CMG
Date/Time Group*	CMLocal
Region*	Default
Softkey Template*	Standard User
SRST Reference*	Disable
Calling Search Space for Auto-registration	< None >
Media Resource Group List	Dallas_Redundant_MRGL
Network Hold MOH Audio Source	< None >
User Hold MOH Audio Source	< None >
Network Locale	< None >

System Route Plan Service Feature Device User Application Help

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Device Pool Configuration

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

Device Pool: SubPub_DP (1 members)**
Status: Ready

Copy Update Delete Reset Devices

Device Pool Settings

Device Pool Name*	SubPub_DP
Cisco CallManager Group*	SubPub_CMG
Date/Time Group*	CMLocal
Region*	Default
Softkey Template*	Standard User
SRST Reference*	Disable
Calling Search Space for Auto-registration	< None >
Media Resource Group List	SanJose_Redundant_MRGL
Network Hold MOH Audio Source	< None >
User Hold MOH Audio Source	< None >
Network Locale	< None >
User Locale	< None >

13. The next example shows the configuration of the MRGL on the device itself. When an MRGL is configured directly on the device, that MRGL takes precedence over the Device Pool configuration.

[Add a new ph](#)
[Add/Update Speed I](#)
[Subscribe/Unsubscribe Serv](#)
[Dependency Rec](#)
[Back to Find/List Ph](#)

Phone Configuration

Directory Numbers

Base Phone

Line 1 - 7000

Line 2 - Add new DN

Phone: SEP0003E30CD017 (Auto 7000)
Registration: Registered with Cisco CallManager 14.48.26.112
IP Address: 14.48.55.104
Status: Ready

Phone Configuration (Model = Cisco 7960)

Device Information

MAC Address*

Description

Device Pool* [\(View details\)](#)

Calling Search Space

AAR Calling Search Space

Media Resource Group List

User Hold Audio Source

Network Hold Audio Source

Location

User Locale

Network Locale

Phone Button and Expansion Module Template Information

Phone Button Template* [\(View button list\)](#)

Troubleshoot

Problem

This error message appears in the Event Viewer:

Error: ConferenceNoMoreResourcesAvailable - No more Conference Resources available

Solution

Complete these steps in order to check if all the hardware conference bridges are registered with the Cisco CallManager.

1. Go to the CallManager Admin page and choose **Service > Media Resource > Conference Bridge**.
2. Click **Find** and check if all the bridges are listed.

Note: Distribute Media Resources in an optimal manner under the Device Pool configuration.

Problem – Fast Busy is Received When Remote Location is Called

When you call the IP Contact Center (IPCC) remote location, the phone rings at the remote location, but when the user picks up the phone, a fast busy signal is received.

Solution

In order to resolve the issue, create separate Media Resource Groups (MRGs) for the software transcoder resources and hardware transcoder resources and make sure that the hardware transcoder resource MRG has first priority in the Media Resource Group List (MRGL).

Related Information

- [Voice Technology Support](#)
 - [Voice and Unified Communications Product Support](#)
 - [Troubleshooting Cisco IP Telephony](#) 
 - [Technical Support & Documentation – Cisco Systems](#)
-

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