Configuring MGCP Gateway Support

This chapter describes the basic tasks for configuring Cisco IOS MGCP gateways to interoperate with Cisco Unified Communications Manager.

Feature History for MLPP for Cisco IOS Voice Gateways

Release	Modification
12.3(8)XY	This feature was introduced.
12.3(11)T	This feature was integrated into Cisco IOS Release 12.3(11)T.

Feature History for MGCP Generic Configuration Support for Cisco Unified Communications Manager

Release	Modification
12.2(2)XN	This feature was introduced.
12.2(11)T	This feature was integrated into Cisco IOS Release 12.2(11)T.

Feature History for Multicast Music-on-Hold

Release	Modification
12.2(2)XN	This feature was introduced.
12.2(11)T	This feature was integrated into Cisco IOS Release 12.2(11)T.

Feature History for MGCP Support for Cisco Unified Communications Manager

Release	Modification
12.1(3)T	This feature was introduced for Cisco Unified Communications Manager 3.0 (formerly known as Cisco CallManager 3.0).
12.1(5)XM	H.323 support was added for E1 and T1 PRI, E&M, E1-CAS, and BRI. Analog support for MGCP and analog DID were added.
12.2(2)XA	Support was added for Cisco Unified Communications Manager 3.0(8) (formerly known as Cisco CallManager 3.0(8)).
12.2(2)XN	Support was added for Cisco Unified Communications Manager 3.1 (formerly known as Cisco CallManager 3.1). New MGCP features included ISDN PRI Backhaul and T1 CAS, Single-Point Configuration, MGCP Gateway Fallback, and Multicast Music-on-Hold (MOH).
12.2(11)T	Support was added for Cisco Unified Communications Manager 3.2 (formerly known as Cisco CallManager 3.2).

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn . You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

For more information about this and related Cisco IOS voice features, see the following:

- "Overview of Cisco Unified Communications Manager and Cisco IOS Interoperability" on page 13 .

- Entire Cisco IOS Voice Configuration Library--including library preface and glossary, other feature documents, and troubleshooting documentation--at http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/123cgcr/voice_c/vcl.htm .

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Prerequisites for Configuring MGCP Gateway Support

• Cisco IOS gateway is configured for VoIP.

• Voice interface card or network module is installed.

• Cisco Unified Communications Manager version 3.2 (formerly known as Cisco CallManager version 3.2) or later is used.

• Cisco Unified Communications Manager version 4.0 (formerly known as Cisco CallManager version 4.0) or later version is used.

Restrictions for Configuring MGCP Gateway Support

• Integrated access is not supported when you control voice traffic using MGCP and Cisco Unified Communications Manager. Integrated access is when the channels on a T1 or E1 interface are divided between a group used for voice and another group used for WAN access.

• T1 and E1 protocols, such as E1 R2, T1 FGD, and PRI NFAS, are not supported with MGCP.

Note   Any configuration update that affects MGCP should be performed during a planned maintenance window while MGCP is disabled; otherwise, updating the configuration could disrupt MGCP functionality. Before making any configuration changes, disable MGCP using the **no mgcp** command. After all configuration changes are completed, use the **mgcp** command to enable MGCP.

Information about MGCP Gateway Support

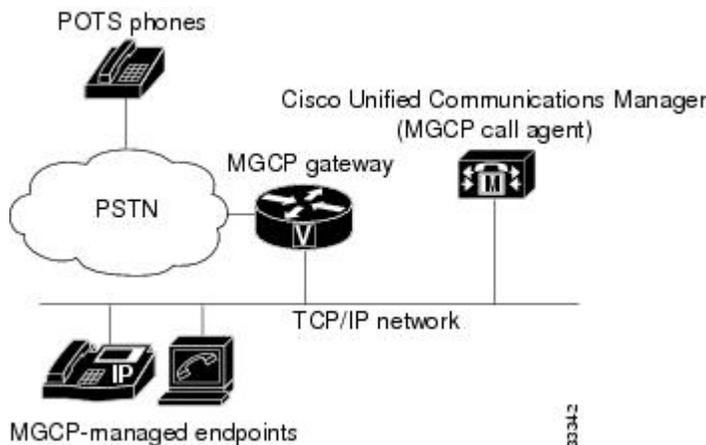## MGCP Gateways and Cisco Unified Communications Manager

MGCP enables the remote control and management of voice and data communications devices at the edge of multiservice IP packet networks. Because of its centralized architecture, MGCP overcomes the distributed configuration and administration problems inherent in the use of protocols such as H.323. MGCP simplifies the configuration and administration of voice gateways and supports multiple (redundant) call agents, eliminating the potential for a single point of failure in controlling the Cisco IOS gateway in the network.

MGCP can be configured as a master or slave protocol to ensure that the gateway receives and executes the configuration, control, and management commands that are issued by Cisco Unified Communications Manager. The MGCP gateway is under the control of Cisco Unified Communications Manager.

MGCP uses endpoints and connections to construct a call. Endpoints are sources of or destinations for data and can be physical or logical locations identifying a device. The voice ports on the Cisco MGCP gateway are its endpoints. Connections can be point-to-point or multipoint. Cisco Unified Communications Manager acts as the MGCP call agent, managing connections between endpoints and controlling how the Cisco IOS gateway functions.

The figure below shows a typical MGCP gateway that is controlled by an MGCP call agent.

Figure 1: MGCP Gateway Controlled by Cisco Unified Communications Manager

The MGCP gateway receives most of its required configuration from the call agent. To configure an MGCP gateway, you simply identify the Cisco Unified Communications Manager server associated with the gateway and identify the gateway to the call agent. The MGCP gateway handles the translation between voice signals and the packet network and interacts with the Cisco Unified Communications Manager server. The server performs signal and call processing.

Cisco Unified Communications Manager Switchover and MGCP Gateway Fallback

This section describes how to configure Cisco Unified Communications Manager failover capabilities on the MGCP gateway.

Switchover

Cisco IOS gateways can maintain links to up to two backup Cisco Unified Communications Manager servers in addition to a primary Cisco Unified Communications Manager. This redundancy enables a voice gateway to switchover to a backup if the gateway loses communication with the primary. The backup server takes control of the devices that are registered with the primary Cisco Unified Communications Manager. The second backup takes control of the registered devices if both the primary and first backup Cisco Unified Communications Manager fail. The gateway preserves existing connections during a switchover to a backup Cisco Unified Communications Manager.

When the primary Cisco Unified Communications Manager server becomes available again, control reverts to that server. Reverting to the primary server can occur immediately, after a configurable amount of time, or only when all connected sessions are released.

Switchback

Switchback is the process a voice gateway uses to reestablish communication with the primary Cisco Unified Communications Manager server when the server becomes available again. Switchback can occur immediately, at a specified time after the last active call ends, or after a specified length of time.
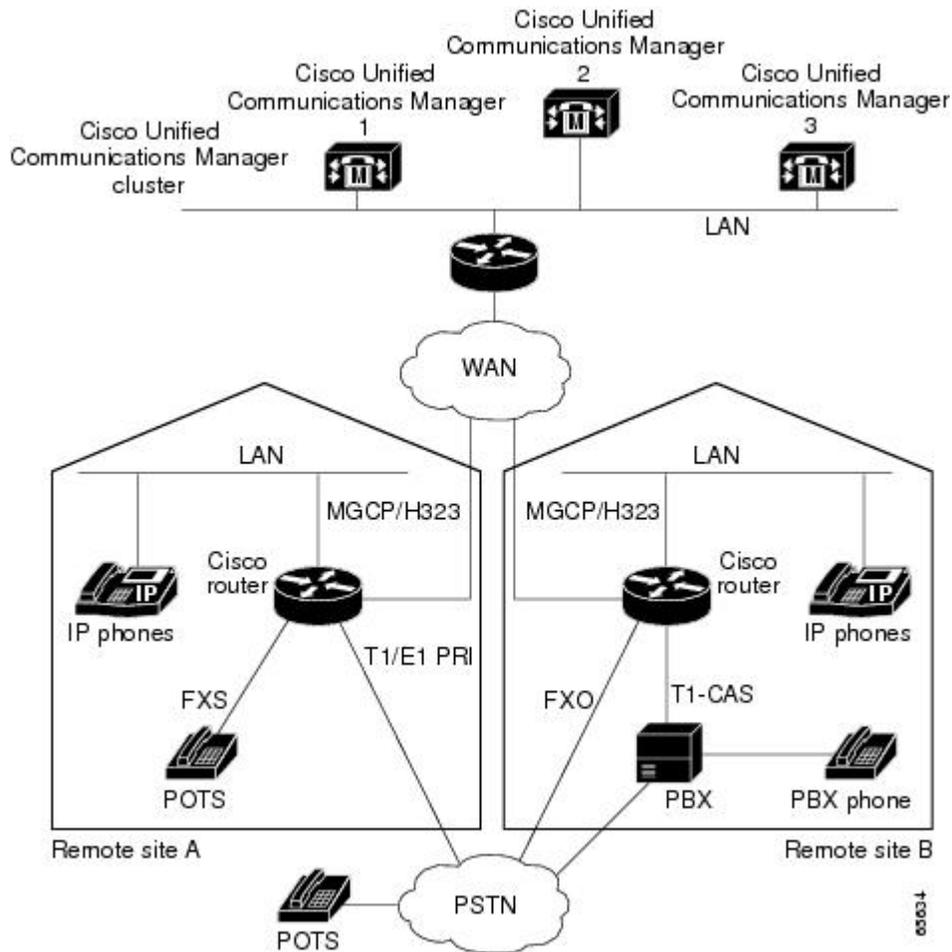
MGCP Gateway Fallback

The MGCP gateway maintains a remote connection to a centralized Cisco Unified Communications Manager cluster by sending MGCP keepalive messages to the Cisco Unified Communications Manager server at 15-second intervals. If the active Cisco Unified Communications Manager server fails to acknowledge receipt of the keepalive message within 30 seconds, the gateway attempts to switch over to the next available Cisco Unified Communications Manager server.

If none of the Cisco Unified Communications Manager servers respond, the gateway switches into fallback mode and reverts to the default H.323 session application for basic call control. H.323 is a standardized communication protocol that enables dissimilar devices to communicate with each other through use of a common set of codecs, call setup and negotiating procedures, and basic data transport methods. The gateway processes calls on its own using H.323 until one of the Cisco Unified Communications Manager connections is restored.

The figure below illustrates a typical VoIP network topology in which MGCP gateway fallback is supported.

Figure 2: Typical VoIP Network Topology Supporting the MGCP Gateway Fallback Feature

The MGCP Gateway Fallback feature provides the following functionality:

- MGCP gateway fallback support--All active MGCP analog and T1 CAS calls are maintained during the fallback transition. Callers are unaware of the fallback transition, and the active MGCP calls are cleared only when the communicating callers hang up. Active MGCP PRI backhaul calls are released during fallback.

Any transient MGCP calls (that is, calls that are not in the connected state) are cleared at the onset of the fallback transition and must be attempted again later.

- Basic connection services in fallback mode--Provides basic connection services for IP telephony traffic that passes through the gateway. When the local MGCP gateway transitions into fallback mode, the default H.323 session application assumes responsibility for handling new calls. Only basic two-party voice calls are supported during the fallback period.

Except for ISDN T1 and E1 PRI calls, all the MGCP calls that are active at the time of fallback are preserved, but transient calls are released. When a user completes (hangs up) an active MGCP call, the MGCP application handles the on-hook event and clears all call resources.

- Rehome support--Provides a rehome function in the gateway fallback mode that detects the restoration of a WAN TCP connection to the primary Cisco Unified Communications Manager server.

When the fallback mode is in effect, the affected MGCP gateway repeatedly tries to open a TCP connection to a Cisco Unified Communications Manager server in the prioritized list of call agents. This process continues until one of the Cisco Unified Communications Manager servers in the prioritized list responds.

The TCP open request from the MGCP gateway is honored, and the gateway reverts to MGCP mode. The gateway sends a Restart-in-Progress (RSIP) message to begin registration with the responding Cisco Unified Communications Manager.

All currently active calls that are initiated and set up during the fallback period are maintained by the default H.323 session application, except ISDN T1 and E1 PRI calls. Transient calls are released. After rehome occurs, the new Cisco Unified Communications Manager assumes responsibility for controlling new IP telephony activity.

The following types of interfaces on the gateway are supported:

- FXS analog interfaces--For connecting to the PSTN or analog phones

- FXO analog interfaces--For connecting to the PSTN or PBXs

- T1 CAS digital interfaces--For connecting to the PSTN or PBXs

- T1 and E1 PRI digital interfaces--For connecting to PBXs and central offices (COs)

MGCP Gateway Registration with Cisco Unified Communications Manager

The table below describes what can happen when either the gateway loses connection to the primary Cisco Unified Communications Manager or the gateway also loses connection to all backup Cisco Unified Communications Manager servers.

Table 1: Registration Scenarios

Terminology	Connection	Registration
Gateway Connection to Primary Cisco Unified Communications Manager		
Failover (also called switchover)	Gateway loses connection to primary Cisco Unified Communications Manager.	Gateway switches over to a backup.
Switchback	Gateway reconnects to primary Cisco Unified Communications Manager.	Gateway switches back to the primary.

Terminology	Connection	Registration
Gateway connection to all Cisco Unified Communications Manager Servers		
Fallback	Gateway loses connection to primary and all backup Cisco Unified Communications Manager servers.	Gateway falls back to H.323 call processing.
Rehome	Gateway reconnects to one of the Cisco Unified Communications Manager servers.	Gateway rehomes, resuming MGCP call processing.

Any calls at the time of reregistration (even those in a transient state such as call setup) remain undisturbed. The newly registered Cisco Unified Communications Manager determines the status of existing calls and maintains or deletes them as appropriate.

Benefits of Cisco Unified Communications Manager Switchover and MGCP Gateway Fallback

- Eliminates a potential single point of failure in the VoIP network by allowing you to designate up to two backup Cisco Unified Communications Manager servers. Your MGCP voice gateways can continue working if the primary Cisco Unified Communications Manager server fails.

- Ensures greater stability in the voice network by preserving existing connections during a switchover to a backup Cisco Unified Communications Manager server.

- Prevents call-processing interruptions or dropped calls in the event of a Cisco Unified Communications Manager or WAN failure.

MGCP Gateway Fallback and Cisco SRST

Cisco Survivable Remote Site Telephony (SRST) provides Cisco Unified Communications Manager with fallback support for Cisco IP phones that are attached to a Cisco router on your local network. Cisco SRST enables routers to provide call-handling support for Cisco IP phones when they lose connection to remote primary, secondary, or tertiary Cisco Unified Communications Manager installations or when the WAN connection is down.

MGCP gateway fallback is a different feature than SRST, and when MGCP gateway fallback is configured as an individual feature, it can be used by a PSTN gateway if you configure H.323 (or some other voice application) as a backup service. To use SRST as your fallback mode on an MGCP gateway, you must configure SRST and MGCP fallback on the same gateway. MGCP and SRST have had the capability to be configured on the same gateway since Cisco IOS Release 12.2(11)T.

Cisco SRST Description

Cisco Unified Communications Manager supports Cisco IP phones at remote sites that are attached to Cisco multiservice routers across the WAN. Prior to Cisco SRST, when the WAN connection between a router and the Cisco Unified Communications Manager failed or when connectivity with Cisco Unified Communications Manager was lost for some reason, Cisco Unified IP phones on the network became unusable for the duration of the failure. Cisco SRST overcomes this problem and ensures that Cisco Unified IP phones offer continuous (although minimal) service by providing call-handling support for Cisco Unified IP phones directly from the Cisco SRST router. The system automatically detects a failure and uses Simple Network Auto Provisioning (SNAP) technology to autoconfigure the branch office router to provide call processing for Cisco Unified IP phones that are registered with the router. When the WAN link or connection to the primary Cisco Unified Communications Manager is restored, call handling reverts back to the primary Cisco Unified Communications Manager.

For more information on Cisco SRST, see Overview of Cisco IOS SRST .

Configuring MGCP Gateway Fallback and Cisco SRST

To make outbound calls while in SRST mode on your MGCP gateway, you must configure two fallback commands on the MGCP gateway. These two commands allow SRST to assume control over the voice port and over call processing on the MGCP gateway. With Cisco IOS releases prior to 12.3(14)T, you must configure MGCP gateway fallback by using the **ccm-manager fallback-mgcp** and **call application alternate** commands. With Cisco IOS releases after 12.3(14)T, you must configure MGCP gateway fallback by using the **ccm-manager fallback-mgcp** and **service** commands.

> **Note** You must configure both commands. For instance, your configuration will not work if you only configure the **ccm-manager fallback-mgcp** command.

Enabling SRST on an MGCP Gateway

To use SRST as your fallback mode with an MGCP gateway, you must configure both SRST and MGCP fallback on the same gateway. The following configuration allows SRST to assume control over the voice port and over call processing on the MGCP gateway.

Gateway Single-Point Configuration for MGCP Gateways

When you configure MGCP gateways to support Cisco Unified Communications Manager, you can use a centralized TFTP boot directory on a host device in your network to automatically download most of the configuration in the XML files. Each MGCP gateway in your VoIP network has an associated gateway-specific configuration that is stored in the centralized TFTP boot directory. A tailored XML file can be created and downloaded from the TFTP server to your designated MGCP gateway. The Cisco Unified Communications Manager server can be configured concurrently as a TFTP server.

When you make changes to the configuration in the database, a message is sent by Cisco Unified Communications Manager to the affected MGCP gateway, instructing the gateway devices to download the new XML configuration file. Each device has an XML parser that interprets the XML file according to its

device-specific requirements. Cisco MGCP gateways, for example, translate the content of the XML file into specific Cisco IOS commands for local execution.

When an MGCP gateway is first started up, it is preconfigured with the following information or it obtains the information through Dynamic Host Configuration Protocol (DHCP):

- A unique device identifier, which can be either of the following:

    - Specific device name on the Cisco MGCP gateway

    - MAC address of the device for gateways that are not using Cisco IOS software

- IP address of the TFTP server in the network and routing information required for access

- Sufficient information for configuration of an IP interface on the device

With this configuration information available at startup, the MGCP gateway downloads the XML file from the TFTP server. The gateway parses the XML file, converts the information to appropriate Cisco IOS configuration commands, and configures itself to run in the VoIP network. Finally, the gateway registers itself with Cisco Unified Communications Manager using an RSIP message. At that point, the MGCP gateway is ready for service in the network.

After a successful configuration download, the MGCP gateway saves the running configuration to nonvolatile random-access memory (NVRAM), which updates the startup configuration. Any manually-added configuration parameters are also saved to NVRAM if they were not previously saved. Manually-added configuration parameters are updates to the configuration that were made using the command-line interface (CLI). Manual configuration updates are separate from the automatic configuration updates made during the configuration download process.

In the event of a configuration failure, the MGCP gateway attempts to restore its current configuration by copying the startup configuration from NVRAM into the running configuration. Because this overwrites the

running configuration, any manually-added configuration parameters could be lost if they were not saved to NVRAM before running the automatic configuration-download process.

Figure 3: Single-Point Configuration for Cisco MGCP Gateways
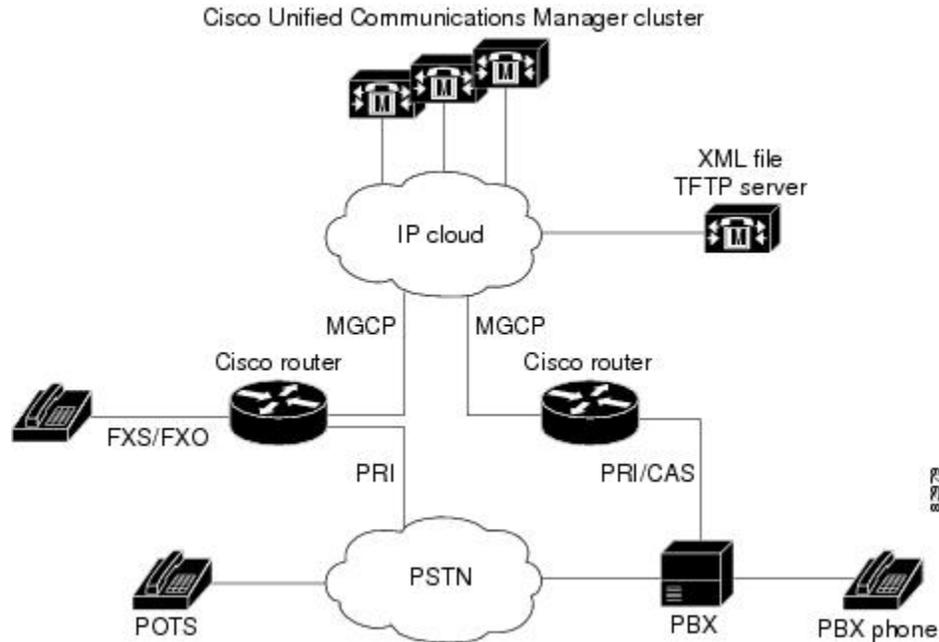
MLPP Service on Cisco MGCP Gateway

Multilevel Precedence and Preemption (MLPP) is a service that allows authorized users to preempt lower priority voice calls to targeted stations or fully subscribed shared resources such as TDM trunks or conference bridges. This capability ensures high-ranking personnel of communication to critical organizations and personnel during network stress situations such as a national emergency. MLPP enables the voice gateway to interoperate with other MLPP-capable networks for call preemption and precedence. MLPP is supported only for MGCP endpoints over T1 CAS (E&M wink start) and T1 PRI using the backhaul feature.

MLPP service applies only to the subscribers and network resources within a specific domain. Connections and resources for a call from an MLPP subscriber are marked with a precedence level and domain identifier. A call can only be preempted by calls of higher precedence from MLPP users in the same domain. The Cisco Communications Manager or defense switched network (DSN) switch sets the maximum precedence level of a subscriber at subscription time.

For more information about MLPP, see the "Multilevel Precedence and Preemption" chapter in the *Cisco CallManager Features and Services Guide* , Release 4.0(1).

MLPP Call Treatment During Cisco Unified Communications Manager Switchover

When a Cisco Unified Communications Manager server fails during the processing of an MLPP call, the call is treated as a transient call and is dropped. The gateway releases the trunks and does a switchover to the backup Cisco Communications Manager server or falls back to H.323 mode, depending on the availability of the backup server. All currently connected MLPP calls are preserved during the switchover, switchback, or

fallback process. After the gateway reregisters with Cisco Communications Manager, call precedence and domain are preserved. During fallback, an incoming MLPP call is treated as a routine priority call.

Multicast Music-on-Hold

The Music-on-Hold (MOH) feature enables you to subscribe to a music streaming service when you are using a Cisco IOS MGCP voice gateway. Music streams from an MOH server to the voice interfaces of on-net and off-net callers that have been placed on hold. Cisco Communications Manager supports the capability to place callers on hold with music supplied from a streaming multicast MOH server. This integrated multicast capability is implemented through the H.323 signaling in Cisco Communications Manager.

By means of a preconfigured multicast address on the gateway, the gateway can "listen" for Real-Time Transport Protocol (RTP) packets that are broadcast from a default router in the network and can relay the packets to designated voice interfaces in the network. Whenever a called party places a calling party on hold, Cisco Communications Manager requests the MOH server to stream RTP packets to the "on-hold" interface through the preconfigured multicast address. In this way, RTP packets are relayed to appropriately configured voice interfaces that have been placed on hold. When you configure a multicast address on a gateway, the gateway sends an Internet Gateway Management Protocol (IGMP) "join" message to the default router, indicating to the default router that the gateway is ready to receive RTP multicast packets.

Multiple MOH servers can be present in the same network, but each server must have a different Class D IP address, and the address must be configured in Cisco Communications Manager and the MGCP voice gateways.

How to Configure MGCP Gateway Support

Enabling MGCP on Cisco IOS Gateways

Perform this task to enable MGCP on a Cisco IOS gateway to support Cisco Unified Communications Manager.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface ethernet** *slot* /*port*
4. **ip address** *ip-address* *subnetmask*
5. **no shutdown**
6. **exit**
7. **hostname** *name*
8. **mgcp validate domain-name**
9. **mgcp**
10. **mgcp call-agent** {*ip-address* | *host-name*} [*port*] [**service-type** *type*] [**version** *version-number*]
11. **mgcp dtmf-relay voip codec** {**all** | **low-bit-rate**} **mode** {**cisco**| **nse** | **out-of-band**}
12. **ccm-manager mgcp**
13. **exit**

DETAILED STEPS

	Command or Action	**Purpose**
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password when prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**interface ethernet** *slot* /*port* **Example:** `Router(config)# interface ethernet 0/1`	Enters interface configuration mode so that you can configure the Ethernet interface for communicating with Cisco Unified Communications Manager. • *Slot* and *port* syntax is platform-dependent; type **?** to determine.

Step 4	**ip address** *ip-address* *subnetmask*
	
	Example:
	
	`Router(config-if)# ip address 10.10.2.23`
	`255.255.255.255`
		Configures an IP address and subnet mask on the router's Ethernet interface.

Step 5	**no shutdown** **Example:** `Router(config-if)# no shutdown`	Activates the Ethernet port.
Step 6	**exit** **Example:** `Router(config-if)# exit`	Exits interface mode and enters global configuration mode.
Step 7	**hostname** *name* **Example:** `Router(config)# hostname smith`	Assigns a unique name to a network router which enables Cisco Unified Communications Manager to identify the device. • Default device name is Router.
Step 8	**mgcp validate domain-name** **Example:** `Router(config)# mgcp validate domain-name`	(Optional) Verifies that the domain name or IP address received as part of the endpoint names in the MGCP messages match those configured on the gateway.

	Command or Action	Purpose
		Note This feature was modified to be disabled by default. You need to use this command to enable hostname and domain (or specific IP address) validation. See the Cisco IOS Voice Command Reference for detailed information about when this modification was made for your release.
Step 9	**mgcp** **Example:** `Router(config)# mgcp`	Enables the MGCP protocol.
Step 10	**mgcp call-agent** {*ip-address* | *host-name*} [*port*] [**service-type** *type*] [**version** *version-number*] **Example:** `Router(config)# mgcp call-agent 10.0.0.21 mgcp 0.1`	Specifies the primary Cisco Unified Communications Manager server's IP address or domain name, and the port gateway service type and version number.
Step 11	**mgcp dtmf-relay voip codec** {**all** | **low-bit-rate**} **mode** {**cisco**| **nse** | **out-of-band**} **Example:** `Router(config)# mgcp dtmf-relay voip codec all mode cisco`	Selects the codec type and the dual tone multifrequency (DTMF) relay services.
Step 12	**ccm-manager mgcp** **Example:** `Router(config)# ccm-manager mgcp`	Enables the MGCP gateway to support Cisco Unified Communications Manager.
Step 13	**exit** **Example:** `Router(config)# exit`	Exits global configuration mode.

Verifying MGCP Configuration on the Cisco IOS Gateway

SUMMARY STEPS

1. **show running-config**
2. **show interfaces ethernet**
3. **show mgcp**

DETAILED STEPS

Step 1   **show running-config**

Use the **show running-config** command to verify that MGCP is enabled on the voice gateway:

Example:

```
Router# show running-config
...
hostname voice-3640
!
...
mgcp
mgcp call-agent 10.0.0.21 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
!
ccm-manager mgcp
!
interface Ethernet0/1
 ip address 10.10.2.23 255.255.255.0
 half-duplex
```

Step 2   **show interfaces ethernet**

Use the **show interfaces ethernet** command to verify that an Ethernet interface is configured to communicate with the Cisco Unified Communications Manager server, for example:

Example:

```
Router# show interfaces ethernet 4/2
Ethernet4/2 is up, line protocol is up
 Hardware is cxBus Ethernet, address is 0000.0c02.d0ce (bia 0000.0c02.d0ce)
 Internet address is 10.10.7.1, subnet mask is 255.255.255.0
 MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
 Encapsulation ARPA, loopback not set, keepalive set (10 sec)
 ARP type: ARPA, ARP Timeout 4:00:00
 Last input 0:00:00, output 0:00:09, output hang never
 Last clearing of "show interface" counters 0:56:40
 Output queue 0/40, 0 drops; input queue 0/75, 0 drops
 Five minute input rate 3000 bits/sec, 4 packets/sec
 Five minute output rate 0 bits/sec, 0 packets/sec
     4961 packets input, 715381 bytes, 0 no buffer
     Received 2014 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     567 packets output, 224914 bytes, 0 underruns
     0 output errors, 168 collisions, 0 interface resets, 0 restarts
     0 babbles, 2 late collision, 7 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

Step 3   **show mgcp**

Use the **show mgcp** command to display the MGCP settings on the Cisco IOS gateway:

Example:

```
Router# show mgcp
MGCP Admin State ACTIVE, Oper State ACTIVE - Cause Code NONE
!MGCP call agent with IP address for Cisco Unified Communications Manager:
MGCP call-agent: 10.0.0.21 2427 Initial protocol service is MGCP, v. 0.1
MGCP block-newcalls DISABLED
MGCP send RSIP for SGCP is DISABLED
MGCP quarantine mode discard/step
MGCP quarantine of persistent events is ENABLED
```

```
!DTMF-relay voip codec parameters:
MGCP dtmf-relay voip codec all mode out-of-band
MGCP dtmf-relay for VoAAL2 disabled for all codec types
MGCP voip modem passthrough mode: CISCO, codec: g711ulaw, redundancy: DISABLED,
MGCP voaal2 modem passthrough mode: NSE, codec: g711ulaw
MGCP TSE payload: 0
MGCP Network (IP/AAL2) Continuity Test timer: 200
MGCP 'RTP stream loss' timer: 5
MGCP request timeout 500, MGCP request retries 3
MGCP rtp unreachable timeout 1000
MGCP gateway port: 2427, MGCP maximum waiting delay 3000
MGCP restart delay 0, MGCP vad DISABLED
MGCP simple-sdp DISABLED
MGCP undotted-notation DISABLED
MGCP codec type g711ulaw, MGCP packetization period 20
MGCP JB threshold lwm 30, MGCP JB threshold hwm 150
MGCP LAT threshold lmw 150, MGCP LAT threshold hwm 300
MGCP PL threshold lwm 1000, MGCP PL threshold hwm 10000
MGCP CL threshold lwm 1000, MGCP CL threshold hwm 10000
MGCP playout mode is adaptive 60, 4, 200 in msec
MGCP IP ToS low delay disabled, MGCP IP ToS high throughput disabled
MGCP IP ToS high reliability disabled, MGCP IP ToS low cost disabled
MGCP IP RTP precedence 5, MGCP signaling precedence: 3
MGCP default package: line-package
MGCP supported packages: gm-package dtmf-package trunk-package line-package
hs-package rtp-package ms-package dt-package sst-packagc-package
MGCP VoAAL2 ignore-lco-codec DISABLED
MGCP T.38 Fax is DISABLED
```

Note   For a description of the fields displayed in this output, see the *Cisco IOSVoice Command Reference*
.

Configuring Switchover and MGCP Gateway Fallback

SUMMARY STEPS

1. **enable**
2. **configure   terminal**
3. ccm-manager redundant-host {*ip-address* | *DNS-name*} [*ip-address* | *DNS-name*]
4. **ccm-manager switchback** {**graceful** | **immediate** | **schedule-time** *hh:mm* | **uptime-delay** *minutes*}
5. **ccm-manager fallback-mgcp**
6. **call application alternate**
7. **exit**
8. **ccm-manager switchover-to-backup**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: Router> enable	• Enter your password when prompted.
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	ccm-manager redundant-host {*ip-address* | *DNS-name*} [*ip-address* | *DNS-name*] **Example:** Router(config)# ccm-manager redundant-host 10.0.0.50	Identifies up to two backup Cisco Unified Communications Manager servers.
Step 4	**ccm-manager switchback** {**graceful** | **immediate** | **schedule-time** *hh:mm* | **uptime-delay** *minutes*} **Example:** Router(config)# ccm-manager switchback immediate	Configures switchback mode for returning control to the primary Cisco Unified Communications Manager. • Default is **graceful**.
Step 5	**ccm-manager fallback-mgcp** **Example:** Router(config)# ccm-manager fallback-mgcp	Enables the MGCP fallback feature.
Step 6	**call application alternate** **Example:** Router(config)# call application alternate	Specifies that the default voice application takes over if the MGCP application is not available.
Step 7	**exit** **Example:** Router(config)# exit	Exits global configuration mode and returns to privileged EXEC mode.
Step 8	**ccm-manager switchover-to-backup** **Example:** Router# ccm-manager switchover-to-backup	Manually redirects the MGCP gateway to the backup Cisco Unified Communications Manager server. The switchover to the backup Cisco Unified Communications Manager server occurs immediately.

Command or Action	Purpose
	Note This command does not switch the gateway to the backup Cisco Unified Communications Manager server if you have set the **ccm-manager switchback** command to **immediate** and the primary Cisco Unified Communications Manager server is still running.

Configuring MGCP Gateway Fallback and Cisco SRST

Note Effective with Cisco IOS Release 12.3(14)T, the **call application alternate** command has been replaced by the **service** command. You can use the **service** command cin all releases after Cisco IOS Release 12.3(14)T. Both commands are reflected in Step Configuring MGCP Gateway Fallback and Cisco SRST.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ccm-manager fallback-mgcp**
4. **call application alternate** [*application name*]
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Router> enable	Enters privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	**ccm-manager fallback-mgcp** **Example:** Router(config)# ccm-mananger fallback-mgcp	Enables the gateway fallback feature and allows an MGCP voice gateway to provide call processing services through SRST or other configured applications when Cisco Unified Communications Manager is unavailable.

	Command or Action	Purpose
Step 4	**call application alternate** [*application name*] **Example:** **service [alternate|default]** *service-name location* **Example:** Router(config)# call application alternate **Example:** Router(config)# service default	With Cisco IOS releases prior to 12.3(14)T, the **call application alternate**command specifies that the default voice application takes over if the MGCP application is not available. The *application-name* argument is optional and indicates the name of the specific voice application to use if the application dial peer fails. If a specific application name is not entered, the gateway uses the DEFAULT application. or With Cisco IOS releases after 12.3(14)T, the **service** command loads and configures a specific, standalone application on a dial peer. The keywords and arguments are as follows: • **alternate** --Optional. Alternate service to use if the service that is configured on the dial peer fails. • **default** --Optional. Specifies that the default service ("DEFAULT") on the dial peer is used if the alternate service fails. • *service-name* --Name that identifies the voice application. • *location* --Directory and filename of the Tcl script or VoiceXML document in URL format. For example, flash memory (flash:filename), a TFTP (tftp://../filename) or an HTTP server (http://../filename) are valid locations.
Step 5	**exit** **Example:** Router(config)# exit	Exits global configuration mode and returns to privileged EXEC mode.

Verifying Switchover and MGCP Gateway Fallback

SUMMARY STEPS

1. **show running-config**
2. **show ccm-manager**
3. **show ccm-manager fallback-mgcp**

DETAILED STEPS

Step 1 **show running-config**
Use the **show running-config** command to verify configuration of the Cisco Unified Communications Manager failover options, for example:

Example:

```
Router# show running-config
...
ccm-manager switchback immediate
ccm-manager fallback-mgcp
ccm-manager redundant-host 10.0.0.50
ccm-manager mgcp
.
.
.
call application alternate DEFAULT
!
```

Step 2 **show ccm-manager**

Use the **show ccm-manager** command to verify the Cisco Unified Communications Manager failover options.

The following example shows one Cisco Unified Communications Manager backup server is configured. Switchback mode is set for immediate return to the primary Cisco Unified Communications Manager server as soon as the server is available.

Example:

```
Router# show ccm-manager
MGCP Domain Name: router.cisco.com
Total number of host: 2
Priority         Status          Host
====================================================
Primary          Registered     10.0.0.201
First backup     Backup polling 10.0.0.50
Second backup    Undefined
Current active Communications Manager: 10.0.0.201
Current backup Communications Manager: 10.0.0.50
Redundant link port:      2428
Failover Interval:        30 seconds
Keepalive Interval:       15 seconds
Last keepalive sent:      00:20:18 (elapsed time: 00:00:06)
Last MGCP traffic time:   00:20:18 (elapsed time: 00:00:06)
Last switchover time:     None
Switchback mode:          Immediate
```

Step 3 **show ccm-manager fallback-mgcp**

Use the **show ccm-manager fallback-mgcp** command to verify whether MGCP fallback is enabled and whether it is active or not (on or off), for example:

Example:

```
Router# show ccm-manager fallback-mgcp
Current active Communications Manager:    10.00.71.29
MGCP Fallback mode:          Enabled/OFF
Last MGCP Fallback start time: 00:00:00
Last MGCP Fallback end time:   00:00:00
```

Note For a description of the fields displayed in these output examples, see the *Cisco IOS Voice Command Reference* .

Configuring POTS Dial Peers on MGCP Gateways

Perform this task to enable the POTS dial peers on your MGCP gateway to communicate with Cisco Unified Communications Manager.

When you have finished this procedure, the voice gateway is ready to communicate with Cisco Unified Communications Manager. It periodically sends out messages attempting to establish a connection. When the Cisco Unified Communications Manager configuration is complete, the connection should automatically establish itself. You should not have to make any further changes on the MGCP gateway.

Note

- All dial-plan configuration elements are controlled by Cisco Unified Communications Manager and should not be configured on the MGCP gateway for MGCP-managed endpoints (that is, any endpoint with an **application mgcpapp**command in its associated dial-peer).

- Do not use the **destination-pattern** or **session target** dial-peer configuration commands or the **connection** voice-port configuration command on the MGCP gateway, unless you are configuring MGCP gateway fallback. To configure MGCP gateway fallback, you must configure the H.323 dial peers with the destination-pattern and session target dial-peer configuration commands.

- Direct inward dial (DID) is required for T1/E1 PRI dial peers.

- Do not use the **application mgcpapp** command in dial peers that support PRI backhaul or BRI backhaul.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice** *tag* **pots**
4. **application mgcpapp**
5. **direct-inward-dial**
6. **port** *slot* /*subunit*/*port*
7. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password when prompted.

	Command or Action	**Purpose**
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	**dial-peer voice** *tag* **pots** **Example:** Router(config)# dial-peer voice 101 pots	Designates the specified dial peer as a POTS device and enters dial-peer configuration mode.
Step 4	**application mgcpapp** **Example:** Router(config-dial-peer)# application mgcpapp	Enables MGCP on the dial peer. **Note** Do not use this command in dial peers that support PRI backhaul or BRI backhaul.
Step 5	**direct-inward-dial** **Example:** Router(config-dial-peer)# direct-inward-dial	(Optional) Enables the direct inward dialing (DID) call treatment for an incoming called number. • Required for T1/E1 PRI dial peers.
Step 6	**port** *slot* /*subunit*/*port* **Example:** Router(config-dial-peer)# port 1/0/1	Binds the MGCP application to the specified voice port. • S*lot* and *port* syntax is platform-dependent; type **?** to determine.
Step 7	**exit** **Example:** Router(config-dial-peer)# exit	Exits dial-peer configuration mode and returns to global configuration mode.

Verifying Dial Peer Configuration for MGCP Gateways

SUMMARY STEPS

1. **show running-config**
2. **show dial-peer voice**
3. **show voice port**

DETAILED STEPS

Step 1   **show running-config**
Use the **show running-config** command to verify the dial peer configuration.

The following example shows two Foreign Exchange Office (FXO) ports and one Foreign Exchange Station (FXS) port that are configured to run under MGCP control. Slot numbering and port numbering begin at 0.

Example:

```
! FXO port
dial-peer voice 1 pots
 application mgcpapp
 port 1/0/0
!
! FXO port
dial-peer voice 2 pots
 application mgcpapp
 port 1/0/1
!
! FXS port
dial-peer voice 3 pots
 application mgcpapp
 port 1/1/0
```

The following example shows a configuration on MGCP voice gateways for T1 CAS with e&m-wink-start emulation.

Example:

```
ccm-manager switchback immediate
ccm-manager fallback-mgcp
ccm-manager mgcp
!
controller T1 1/0
 framing esf
 linecode b8zs
 ds0-group 1 timeslots 1-24 type e&m-wink-start
!
voice-port 1/0:1
!
dial-peer voice 1 pots
 application mgcpapp
 destination-pattern 91..........
 port 1/0:1
```

The following example shows a configuration on MGCP voice gateways for FXS ports.

Example:

```
dial-peer voice 1 pots
 application mgcpapp
 destination-pattern 555-1212
 port 1/0/0
```

The following example shows a configuration on MGCP voice gateways for FXO ports.

Example:

```
dial-peer voice 2 pots
 application mgcpapp
 destination-pattern 527....
```

```
prefix 527
port 1/1/1
```

The following example shows a configuration on MGCP gateways for VoIP calls, when the fallback feature is used.

Example:

```
dial-peer voice 555 voip
 application mgcpapp
 destination pattern 555...
 incoming-called-number 444...
 session-target ipv4:172.20.21.8
 codec g711ulaw
```

Note   When you configure MGCP gateway fallback support, the POTS dial peer must include the **application mgcpapp**command and must specify the voice port. For the default session application to take over during fallback, you must also configure a destination pattern.

Step 2   **show dial-peer voice**
Use the show dial-peer voice command to verify the configuration of the POTS dial peer, for example:

Example:

```
Router# show dial-peer voice 1000
VoiceEncapPeer1000
information type = voice,
description = `',
tag = 1000, destination-pattern = `',
answer-address = `', preference=0,
numbering Type = `unknown'
group = 1000, Admin state is up, Operation state is down,
incoming called-number = `', connections/maximum = 0/unlimited,
DTMF Relay = disabled,
huntstop = disabled,
in bound application associated: 'mgcpapp'

out bound application associated: ''
dnis-map =
permission :both
incoming COR list:maximum capability
outgoing COR list:minimum requirement
type = pots, prefix = `',
forward-digits default
session-target = `', voice-port = `',
direct-inward-dial = disabled,
digit_strip = enabled,
register E.164 number with GK = TRUE
Connect Time = 0, Charged Units = 0,
Successful Calls=0, Failed Calls=0, Incomplete Calls=0
Accepted Calls = 0, Refused Calls = 0,
Last Disconnect Cause is "",
Last Disconnect Text is "",
Last Setup Time = 0.
```

Step 3   **show voice port**
Use the show voice port command to verify that the voice port is operational. The following is sample output from a Cisco 3600 series router with an FXS analog voice port:

Example:

```
Router# show voice port 1/0/0
Foreign Exchange Office 1/0/0 Slot is 1, Sub-unit is 0, Port is 0
Type of VoicePort is FXO
```

```
Operation State is DORMANT
Administrative State is UP
No Interface Down Failure
Description is not set
Noise Regeneration is enabled
Non Linear Processing is enabled
Non Linear Mute is disabled
Non Linear Threshold is -21 dB
Music On Hold Threshold is Set to -38 dBm
In Gain is Set to 0 dB
Out Attenuation is Set to 3 dB
Echo Cancellation is enabled
Echo Cancellation NLP mute is disabled
Echo Cancellation NLP threshold is -21 dB
Echo Cancel Coverage is set to 8 ms
Playout-delay Mode is set to default
Playout-delay Nominal is set to 60 ms
Playout-delay Maximum is set to 200 ms
Playout-delay Minimum mode is set to default, value 40 ms
Playout-delay Fax is set to 300 ms
Connection Mode is normal
Connection Number is not set
Initial Time Out is set to 10 s
Interdigit Time Out is set to 10 s
Call Disconnect Time Out is set to 60 s
Ringing Time Out is set to 180 s
Wait Release Time Out is set to 30 s
Companding Type is u-law
Region Tone is set for US
Analog Info Follows:
Currently processing none
Maintenance Mode Set to None (not in mtc mode)
Number of signaling protocol errors are 0
Impedance is set to 600r Ohm
Station name None, Station number None
Translation profile (Incoming):
Translation profile (Outgoing):
Voice card specific Info Follows:
Signal Type is loopStart
Number Of Rings is set to 1
Supervisory Disconnect is inactive
Answer Supervision is inactive
Hook Status is On Hook
Ring Detect Status is inactive
Ring Ground Status is inactive
Tip Ground Status is inactive
Dial Type is dtmf
Digit Duration Timing is set to 100 ms
InterDigit Duration Timing is set to 100 ms
Pulse Rate Timing is set to 10 pulses/second
InterDigit Pulse Duration Timing is set to 750 ms
Percent Break of Pulse is 60 percent
GuardOut timer is 2000 ms
```

Note   For a description of the fields displayed in this output, see the *Cisco IOS Voice Command Reference*.

Verifying Single-Point Configuration for MGCP Gateways

SUMMARY STEPS

1. **show running-config**
2. **show ccm-manager config-download**

DETAILED STEPS

Step 1   **show running-config**
Use the **show running-config** command to verify the single-point download configuration, for example:

Example:

```
Router# show running-config
...
ccm-manager switchback immediate
ccm-manager fallback-mgcp
ccm-manager redundant-host 10.10.10.1
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 10.10.1.10
ccm-manager config
!
```

Step 2   **show ccm-manager config-download**
Use the **show ccm-manager config-download** command to verify the download status. The output indicates that four downloads were successful.

Example:

```
Router# show ccm-manager config-download
Configuration Auto-download Information
=======================================
Current version-id: {1645327B-F59A-4417-8E01-7312C61216AE}
Last config-downloaded:00:00:49
Current state: Waiting for commands
Configuration Download statistics:
        Download Attempted              : 4
          Download Successful           : 4
          Download Failed               : 0
        Configuration Attempted         : 1
          Configuration Successful      : 1
          Configuration Failed(Parsing): 0
          Configuration Failed(config) : 0
Last config download command: New Registration
```

Note   For a description of the fields displayed in this output, see the *Cisco IOS Voice Command Reference*
.

Configuring Multicast Music-on-Hold

This section describes how to configure your gateway to provide music to customers on hold.

Before You Begin

The default router in the network for handling multicast traffic must have the following enabled:

- Multicast routing
- A multicast routing protocol, for example Protocol Independent Multicast (PIM) or Distance Vector Multicast Routing Protocol (DVMRP)
- An IP routing protocol, for example Routing Information Protocol (RIP) or Open Shortest Path First (OSPF)
- Cisco Unified Communications Manager 3.1 (formerly known as Cisco CallManager 3.1) or higher

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ccm-manager music-on-hold**
4. **ccm-manager music-on-hold bind** *interface*
5. **exit**

DETAILED STEPS

	Command or Action	**Purpose**
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. - Enter your password when prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**ccm-manager music-on-hold** **Example:** `Router(config)# ccm-manager music-on-hold`	Enables music-on-hold.

	Command or Action	**Purpose**
Step 4	**ccm-manager music-on-hold bind** *interface* **Example:** Router(config)# ccm-manager music-on-hold bind async	(Optional) Binds the multicast MOH feature to a designated interface.
Step 5	**exit** **Example:** Router(config)# exit	Exits global configuration mode.

Verifying Music-on-Hold

SUMMARY STEPS

1. **show running-config**
2. **show ccm-manager music-on-hold**

DETAILED STEPS

Step 1 **show running-config**
Use the **show running-config** command to verify the MOH configuration, for example:

Example:

```
Router# show running-config
...
ccm-manager redundant-host 10.0.0.21
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 10.0.0.21
ccm-manager config
!
```

Step 2 **show ccm-manager music-on-hold**
Use the **show ccm-manager music-on-hold** command to display information about the currently active MOH sessions, for example:

Example:

```
Router#
 show ccm-manager music-on-hold
Multicast     RTP      Packets     Call                    Incoming
Address       Port     In/Out      ID        Protocol      Interface
10.10.20.22   16256    3000/3000   1         IGMP          fe0/0
```

Note For a description of the fields displayed in this output, see the *Cisco IOS Voice Command Reference*
.

Configuring MLPP Service on Cisco MGCP Gateways

Perform this task to configure the MGCP package capability for MLPP.

Note If you downloaded the default configuration file from TFTP, you do not need to manually configure MLPP on the MGCP gateway. The MLPP configuration is contained in the default configuration.

Before You Begin

- Cisco IOS Release 12.3(11)T or later

- Cisco Unified Communications Manager 4.0 (formerly known as Cisco CallManager 4.0) or later

- DSPWare 4.0

- Telogy DSP4 (Catalyst 6000 switches)

- Preemptions and precedences should be configured in Cisco Communications Manager. Interfaces, dial peers, voice ports, controllers, framing, and line codes should also be configured.

- Cisco Catalyst 6500 series and Cisco 7600 series Communication Media Module (CMM) requires WS-SVC-CMM-6T1 port adapter.

Note
- Supported only for MGCP endpoints over T1 CAS (E&M wink start) and T1 PRI (backhaul).

- Supported only by Cisco Communications Manager; does not work with other call agents.

- Conferenced call legs are not supported for preemption with Cisco Communications Manager.

- H.323, FXS, and FXO endpoints are not supported.

- Not supported for calls that originate or terminate in the gateway when the gateway is in H.323 fallback mode.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. mgcp package-capability **pre-package**
4. **exit**

DETAILED STEPS

	Command or Action	**Purpose**
Step 1	**enable** **Example:** Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	mgcp package-capability **pre-package** **Example:** Router(config)# mgcp package-capability pre-package	Enables MLPP as an MGCP package capability type on the voice gateway.
Step 4	**exit** **Example:** Router(config)# exit	Exits to privileged EXEC mode.

Configuring Fallback when Using MLPP on T1 CAS

When the gateway is in fallback mode, the precedence digit must be stripped from the dial string for T1 CAS calls. Perform this task to configure SRST to handle stripping the precedence digit.

Note   For information on configuring digit stripping options for your specific dial plan, see the "Setting Up Call Handling" chapter in the *Cisco Survivable Remote Site Telephony Version 3.2 System Administration Guide* .

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **call-manager-fallback**
4. **ip source-address** *ip-address* [**port** *port*] [**any-match** | **strict-match**]
5. **max-dn** *max-directory-numbers*
6. **max-ephones** *max-phones*
7. **dialplan-pattern** *tag pattern* **extension-length** *length* [**extension-pattern** *extension-pattern*] [**no-reg**]
8. **translate** {**called** | **calling**} *translation-rule-tag*
9. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	**call-manager-fallback** **Example:** Router(config)# call-manager-fallback	Enters call-manager-fallback configuration mode.
Step 4	**ip source-address** *ip-address* [**port** *port*] [**any-match** | **strict-match**] **Example:** Router(config-cm-fallback)# ip source-address 10.10.200.23 port 2000	Enables the voice gateway to receive messages from the Cisco IP phones through the specified IP addresses and provides for strict IP address verification.
Step 5	**max-dn** *max-directory-numbers* **Example:** Router(config-cm-fallback)# max-dn 12	Sets the maximum number of directory numbers or virtual voice ports that can be supported by the voice gateway. The maximum number is platform dependent.

	Command or Action	Purpose
Step 6	**max-ephones** *max-phones* **Example:** Router(config-cm-fallback)# max-ephones 10	Configures the maximum number of Cisco IP phones that can be supported by the voice gateway. The maximum number is platform dependent.
Step 7	**dialplan-pattern** *tag pattern* **extension-length** *length* [**extension-pattern** *extension-pattern*] [**no-reg**] **Example:** Router(config-cm-fallback)# dialplan-pattern 1 [A-D].... extension-length 4	Creates a global prefix that can be used to expand the abbreviated extension numbers into fully qualified E.164 numbers.
Step 8	**translate** {**called** | **calling**} *translation-rule-tag* **Example:** Router(config-cm-fallback)# translate calling 1	Applies a translation rule to modify the phone number dialed or received by any Cisco IP phone user while Cisco Communications Manager fallback is active.
Step 9	**end** **Example:** Router(config-cm-fallback)# end	Exits to privileged EXEC mode.

Verifying MLPP Configuration

SUMMARY STEPS

1. Use the **show running-config** command to verify the configuration of the MGCP package, for example:
2. Use the **show mgcp** command to display the MGCP configuration details, for example:

DETAILED STEPS

Step 1 Use the **show running-config** command to verify the configuration of the MGCP package, for example:

Example:

```
Router# show running-config
...
mgcp
mgcp call-agent OTHERCLUSTER 2427 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000 action notify
mgcp package-capability rtp-package
```

```
no mgcp package-capability res-package
mgcp package-capability sst-package
no mgcp package-capability fxr-package
mgcp package-capability pre-package
no mgcp timer receive-rtcp
mgcp sdp simple
no mgcp validate domain-name
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
!
```

Step 2   Use the **show mgcp** command to display the MGCP configuration details, for example:

Example:

```
Router# show mgcp
MGCP Admin State ACTIVE, Oper State ACTIVE - Cause Code NONE
MGCP call-agent: 172.18.195.147 2300 Initial protocol service is SGCP 1.5
MGCP block-newcalls DISABLED
MGCP send SGCP RSIP:forced/restart/graceful DISABLED, disconnected ENABLED
MGCP quarantine mode discard/step
MGCP quarantine of persistent events is ENABLED
MGCP dtmf-relay for VoIP disabled for all codec types
MGCP dtmf-relay voaal2 codec all
MGCP voip modem passthrough mode: NSE, codec: g711ulaw, redundancy: DISABLED,
MGCP voaal2 modem passthrough mode: NSE, codec: g711ulaw
MGCP TSE payload: 100
MGCP T.38 Named Signalling Event (NSE) response timer: 200
MGCP Network (IP/AAL2) Continuity Test timer: 3000
MGCP 'RTP stream loss' timer: 2
MGCP request timeout 500
MGCP maximum exponential request timeout 4000
MGCP gateway port: 2427, MGCP maximum waiting delay 3000
MGCP restart delay 0, MGCP vad DISABLED
MGCP rtrcac DISABLED
MGCP system resource check DISABLED
MGCP xpc-codec: DISABLED, MGCP persistent hookflash: DISABLED
MGCP persistent offhook: ENABLED, MGCP persistent onhook: DISABLED
MGCP piggyback msg DISABLED, MGCP endpoint offset DISABLED
MGCP simple-sdp DISABLED
MGCP undotted-notation DISABLED
MGCP codec type g711ulaw, MGCP packetization period 20
MGCP JB threshold lwm 30, MGCP JB threshold hwm 150
MGCP LAT threshold lmw 150, MGCP LAT threshold hwm 300
MGCP PL threshold lwm 1000, MGCP PL threshold hwm 10000
MGCP CL threshold lwm 1000, MGCP CL threshold hwm 10000
MGCP playout mode is adaptive 60, 4, 200 in msec
MGCP IP ToS low delay disabled, MGCP IP ToS high throughput disabled
MGCP IP ToS high reliability disabled, MGCP IP ToS low cost disabled
MGCP IP RTP precedence 5, MGCP signaling precedence: 3
MGCP default package: line-package
MGCP supported packages: gm-package dtmf-package trunk-package line-package
                         hs-package atm-package ms-package dt-package res-package
                         mt-package pre-package
```

Configuration Examples for MGCP Gateway Support

> **Note** To view relevant configuration examples, go to the Cisco Systems Technologies website at http://cisco.com/en/US/tech/index.html . From the website, select **Voice > IP Telephony/VoIP**, then click **Technical Documentation > Configuration Examples**.

MGCP Gateway with T1 CAS Example

The following example shows MGCP fallback configured on a voice gateway with T1 CAS.

```
Current configuration : 2181 bytes
!
version 12.2
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Test-3640a
!
logging rate-limit console 10 except errors
!
memory-size iomem 25
voice-card 3
!
ip subnet-zero
!
no ip domain-lookup
ip domain-name test.com
!
no ip dhcp-client network-discovery
frame-relay switching
mgcp
mgcp call-agent 10.0.0.21 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000
mgcp package-capability rtp-package
no mgcp timer receive-rtcp
call rsvp-sync
!
ccm-manager switchback immediate
ccm-manager fallback-mgcp
ccm-manager redundant-host 10.0.0.21
ccm-manager mgcp
!
controller T1 3/0
 framing esf
 linecode b8zs
 ds0-group 1 timeslots 1 type e&m-wink-start
!
controller T1 3/1
 framing sf
 linecode ami
!
interface FastEthernet0/0
 ip address 10.0.0.21 255.255.255.224
 duplex auto
 speed auto
!
interface Serial0/0
```

```
 ip address 10.0.0.21 255.255.255.224
 encapsulation frame-relay
 no keepalive
 frame-relay interface-dlci 300
!
interface Serial0/1
 no ip address
 shutdown
 clockrate 2000000
!
interface Ethernet2/0
 ip address 10.0.0.21 255.255.255.224
 half-duplex
!
interface TokenRing2/0
 no ip address
 shutdown
 ring-speed 16
!
ip classless
ip route 10.0.0.21 255.255.255.0 14.0.0.1
ip route 10.0.0.21 255.255.255.0 14.0.0.1
ip route 10.0.0.21 255.255.255.0 14.0.0.1
ip route 10.0.0.21 255.255.255.0 14.0.0.1
ip route 10.0.0.21 255.255.255.255 Ethernet2/0
ip route 10.0.0.21 255.255.255.255 Ethernet2/0
no ip http server
!
snmp-server manager
!
voice-port 1/0/0
!
voice-port 1/0/1
!
voice-port 1/1/0
!
voice-port 1/1/1
!
voice-port 3/0:1
!
dial-peer cor custom
!
dial-peer voice 44 pots
 application mgcpapp
 destination-pattern 4301
 port 1/1/0
!
dial-peer voice 55 pots
 application mgcpapp
 destination-pattern 4302
 port 1/1/1
!
dial-peer voice 85 voip
 destination-pattern 805....
 session target ipv4:10.0.0.21
 codec g711ulaw
!
dial-peer voice 33 pots
 application mgcpapp
 destination-pattern 807....
 port 3/0:1
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login
end
```

> **Note** If the ccm-manager config command is enabled and you separate the MGCP and H.323 dial peers under different tags, make sure that the MGCP dial peers are configured before the H.323 dial peers.

MGCP Gateway with T1 PRI Example

The following example shows MGCP fallback configured on a voice gateway with T1 PRI ports.

```
version 12.2
no parser cache
no service single-slot-reload-enable
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname voice-3640
!
logging rate-limit console 10 except errors
!
voice-card 1
!
ip subnet-zero
!
no ip domain-lookup
!
no ip dhcp-client network-discovery
mgcp
mgcp call-agent 172.16.240.124 2427 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000 action notify
mgcp modem passthrough voip mode cisco
mgcp package-capability rtp-package
mgcp package-capability sst-package
no mgcp timer receive-rtcp
!
ccm-manager fallback-mgcp
ccm-manager redundant-host CM-B
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server cm-a
ccm-manager config
!
controller T1 1/0
 framing esf
 linecode b8zs
 pri-group timeslots 1-24 service mgcp
!
controller T1 1/1
 framing esf
 linecode b8zs
 pri-group timeslots 1-24 service mgcp
!
interface Serial1/0:23
 no ip address
 no logging event link-status
 isdn switch-type primary-ni
 isdn incoming-voice voice
 isdn T306 30000
 isdn bind-l3 ccm-manager
 no cdp enable
!
voice-port 1/0:23
!
dial-peer voice 9991023 pots
 application mgcpapp
```

```
 direct-inward-dial
 port 1/0:23
!
dial-peer voice 9991123 pots
 application mgcpapp
 direct-inward-dial
 port 1/1:23
!
dial-peer voice 1640001 pots
 destination-pattern 16.....
 direct-inward-dial
 port 1/0:23
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login
!
end
```

> **Note** DID is required for T1/E1 PRI dial peers.

Multicast Music-on-Hold Example

The following example shows multicast MOH configured for an MGCP voice gateway:

```
version 12.2
no parser cache
no service single-slot-reload-enable
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname voice-3640
!
logging rate-limit console 10 except errors
!
memory-size iomem 10
voice-card 1
!
ip subnet-zero
!
ip domain-name test.com
!
no ip dhcp-client network-discovery
mgcp
mgcp call-agent 10.0.0.21 2427 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000
mgcp modem passthrough voip mode cisco
mgcp package-capability rtp-package
mgcp package-capability sst-package
no mgcp timer receive-rtcp
call rsvp-sync
!
ccm-manager redundant-host 10.0.0.21
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 10.0.0.21
ccm-manager config
!
controller T1 2/0
 framing sf
 linecode ami
```

```
 ds0-group 0 timeslots 1 type e&m-wink-start
!
controller T1 2/1
 framing sf
 linecode ami
!
interface FastEthernet0/0
 ip address 10.0.0.21 255.255.255.0
 no ip mroute-cache
 duplex auto
 speed auto
 no cdp enable
!
voice-port 1/0/0
!
voice-port 1/0/1
!
voice-port 2/0:0
!
dial-peer cor custom
!
dial-peer voice 125 pots
 application mgcpapp
 port 1/0/0
!
dial-peer voice 150 pots
 application mgcpapp
 port 2/0:0
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login
!
no scheduler max-task-time
scheduler allocate 4000 4000
!
end
```

MLPP on Cisco 2801 Example

The following configuration includes both MLPP T1 CAS and T1 PRI.

```
Current configuration :1851 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2801_router
!
boot-start-marker
boot-end-marker
!
!
no network-clock-participate wic 1
network-clock-participate wic 2
no network-clock-participate wic 3
no network-clock-participate wic 4
mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmi snmp-timeout 180
no aaa new-model
ip subnet-zero
ip cef
!
```

```
!
!
no ftp-server write-enable
isdn switch-type primary-ni
voice-card 0
!
!
!
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server 192.168.12.125
!
!
controller T1 2/0
 framing esf
 clock source internal
 linecode b8zs
 ds0-group 1 timeslots 1-3 type e&m-wink-start
!
controller T1 2/1
 framing esf
 linecode b8zs
 pri-group timeslots 1,24 service mgcp
!
!
!
interface FastEthernet0/0
 ip address 192.168.12.38 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial2/1:23
 no ip address
 isdn switch-type primary-ni
 isdn incoming-voice voice
 isdn bind-l3 ccm-manager
 no cdp enable
!
ip classless
ip http server
!
!
!
control-plane
!
!
voice-port 1/0
!
voice-port 1/1
!
voice-port 2/0:1
!
voice-port 2/1:23
!
mgcp
mgcp call-agent 192.168.12.125 2427 service-type mgcp version 0.1
mgcp rtp unreachable timeout 1000 action notify
mgcp package-capability rtp-package
no mgcp package-capability res-package
mgcp package-capability sst-package
no mgcp package-capability fxr-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
```

```
!
!
!
dial-peer voice 1 pots
 application mgcapp
 port 2/0:1
!
!
line con 0
line aux 0
line vty 0 4
 login
!
end
```

MLPP on Cisco 2621 Example

```
Current configuration :2530 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname 2621-other
!
boot-start-marker
boot system flash:c2600-ipvoice-mz
boot-end-marker
!
logging buffered 10000000 debugging
enable password lab
!
voice-card 1
!
no aaa new-model
ip subnet-zero
ip tcp synwait-time 13
!
!
ip domain name sample-vlan200.cisco.com
ip host demo 10.69.1.129
ip name-server 10.10.100.100
no ftp-server write-enable
isdn switch-type primary-ni
!
!
voice call carrier capacity active
!
!
ccm-manager fallback-mgcp
ccm-manager mgcp
ccm-manager music-on-hold
ccm-manager config server OTHER
ccm-manager config
!
!
controller T1 1/0
 framing esf
 crc-threshold 320
 clock source internal
 linecode b8zs
 ds0-group 1 timeslots 1-23 type e&m-wink-start
!
controller T1 1/1
 framing esf
 crc-threshold 320
 clock source internal
 linecode b8zs
```

```
   ds0-group 1 timeslots 1-23 type e&m-wink-start
!
!
interface FastEthernet0/0
 ip address 10.10.200.23 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
ip classless
ip route 0.0.0.0 0.0.0.0 FastEthernet0/0
ip http server
!
control-plane
!
!
call application alternate default
!
!
voice-port 1/0:1
!
voice-port 1/1:1
!
mgcp
mgcp call-agent OTHER 2427 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode out-of-band
mgcp rtp unreachable timeout 1000 action notify
mgcp package-capability rtp-package
no mgcp package-capability res-package
mgcp package-capability sst-package
no mgcp package-capability fxr-package
mgcp package-capability pre-package
no mgcp timer receive-rtcp
mgcp sdp simple
no mgcp validate domain-name
mgcp fax t38 inhibit
mgcp rtp payload-type g726r16 static
!
mgcp profile default
!
!
dial-peer cor custom
!
!
dial-peer voice 999101 pots
 application mgcpapp
 port 1/0:1
!
dial-peer voice 999111 pots
 application mgcpapp
 port 1/1:1
!
dial-peer voice 999222 pots
 preference 1
 destination-pattern 100.
 direct-inward-dial
 port 1/0:1
 forward-digits all
!
!
call-manager-fallback
 max-conferences 4
 ip source-address 10.10.200.23 port 2000
 max-ephones 10
 max-dn 10
 dialplan-pattern 1 [A-D].... extension-length 4
 translate calling 1
!
```

```
!
line con 0
 exec-timeout 0 0
line aux 0
 exec-timeout 0 0
 no exec
 transport input all
line vty 0 4
 password lab
 login
!
exception core-file core_2621 compress
exception region-size 65536
exception dump 10.10.100.101
!
!
end
```

Where to Go Next

- To configure conferencing, transcoding, and MTP support on a Cisco IOS gateway, see "Configuring Enhanced Conferencing and Transcoding for Voice Gateway Routers" on page 67 .

- To enable MGCP PRI backhaul support, see "Configuring MGCP PRI Backhaul and T1 CAS Support for Cisco Unified Communications Manager" on page 113 .

- To enable MGCP BRI backhaul support, see "Configuring MGCP-Controlled Backhaul of BRI Signaling in Conjunction with Cisco Unified Communications Manager" on page 129 .

- To download region-specific tones and their associated frequencies, amplitudes, and cadences, see "Configuring Tone Download to MGCP Gateways" on page 145 .

Additional References

- "Overview of Cisco Unified Communications Manager and Cisco IOS Interoperability" on page 13 --Describes basics of underlying technology and lists related documents.

- Configuring Media Gateway Control Protocol and Related Protocols --Describes MGCP concepts and configuration procedures.

- Configuring the Cisco IOS MGCP Gateway --Describes the basics of configuring an MGCP gateway to support Cisco Communications Manager.

- How to Configure MGCP with Digital PRI and Cisco Unified Communications Manager --Describes how to configure MGCP with PRI.

- MGCP Gateway Fallback Transition to Default H.323 Session Application --Describes how to enable an MGCP gateway to fallback to an H323 session application when the WAN connection to the primary Cisco Communications Manager server is lost, and no backup Cisco Communications Manager server is available.

- MGCP with Digital CAS and Cisco Unified Communications Manager Configuration Example --Describes how to use MGCP between a Cisco IOS gateway and a Cisco Communications Manager Media Convergence Server (MCS).