



Cisco IOS Telephony Service Version 2.01

August, 2002

Feature History

Release	Version	Modification
12.1(5)YD	Version 1.0	This service was introduced on the Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series integrated access devices (IAD)s.
12.2(2)XT	Version 2.0	Additional IP phone features were added. Version 2.0 was implemented on the Cisco 1750 and Cisco 1751 routers.
12.2(8)T		This service was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1		This service was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	Version 2.01	This service was integrated into Cisco IOS Release 12.2(11)T. Additional voice ports for each IP phone, top-line description for the Cisco IP Phone 7960 and Cisco IP Phone 7940, and ATA-186 support were added. This service was implemented on the Cisco 1760 routers and support for Cisco 1750 was removed.

This document describes Cisco IOS Telephony Service, based on Cisco IOS software, on the Cisco 1751, Cisco 1760, Cisco 2600 series, Cisco 2600-XM series, Cisco 3600 series, Cisco IAD2420 series IADs, Cisco 3725, and Cisco 3745 routers. The Cisco IOS Telephony Service provides a telephony system perfect for a small office with a small number of extensions.



Note

You must purchase a feature license to turn this new feature on. You also need an account on Cisco.com to access the Cisco IP phone firmware versions.

This document includes the following sections:

- [Feature Overview, page 2](#)
- [Restrictions of Cisco IOS Telephony Service, page 10](#)
- [Supported Platforms and Devices, page 12](#)
- [Supported Standards, MIBs, and RFCs, page 13](#)
- [Prerequisites, page 14](#)

- [Configuration Tasks, page 14](#)
- [Verification and Troubleshooting, page 24](#)
- [Additional Configuration Tasks, page 25](#)
- [Advanced Configuration Tasks, page 42](#)
- [Monitoring and Maintaining Cisco IOS Telephony Service, page 70](#)
- [Configuration Examples, page 71](#)
- [Command Reference, page 77](#)

Feature Overview

Cisco IOS Telephony Service provides basic Cisco IP phone call-handling capabilities in a LAN environment on the Cisco routers. This service enables the Cisco multiservice routers to act as the Cisco IOS Telephony Service for the Cisco IP Phone 7960, Cisco IP Phone 7940, Cisco IP Phone 7910, and Cisco IP Conference Station 7935. This service also helps download phone software images and configures and manages the Cisco IP phones in your LAN. Cisco IOS Telephony Service provides a telephony system perfect for a small office with a small number of extensions.

Cisco IP Phones

Cisco IOS Telephony Service supports the Cisco IP Phone 7960, Cisco IP Phone 7940, Cisco IP Phone 7910, and Cisco IP Conference Station 7935.

Phone Firmware

The Cisco multiservice routers provide support for updating and storing of Cisco IP phone firmware. The Cisco IOS Telephony Service router also provides TFTP support for downloading the phone firmware files to the phone.



Note

When installing new Cisco IP phones to an ITS ATA device configuration, remove the **tftp-server flash:XMLDefault.cnf.xml** command temporarily until the new phones are installed properly. After the phones are installed and working correctly, restore the **tftp-server flash:XMLDefault.cnf.xml** command.

A way to verify correct phone load installation is to set registration debugging with the **debug ephone register** command, reset the phones, and look at the StationAlarmMessage displayed during phone re-registration. The "Load=" parameter should appear in the display, followed by an abbreviated version name corresponding to the phone load file

Phone Configuration

When Cisco IOS Telephony Service is configured, the Cisco IP phones receive initial configuration information and phone firmware from the TFTP server. In most cases, the Cisco IP phones obtain the IP address of their TFTP server with the Dynamic Host Configuration Protocol (DHCP) **option 150** command. For Cisco IOS Telephony Service operation, the TFTP server address obtained by the Cisco IP phones should point at the Cisco IOS Telephony Service router IP address. The Cisco IP phones

attempt to transfer a configuration file called SEPDEFAULT.cnf. This file is automatically generated by the Cisco IOS Telephony Service router through the **ip source-address** command and placed in the router's Flash memory. The SEPDEFAULT.cnf file contains the IP address that the phones use to register for service, using the Skinny Client Control Protocol (SCCP). This IP address should correspond to a valid Cisco IOS Telephony Service router IP address (and may be the same as the router TFTP server address). Access to the SEPDEFAULT.cnf file must be granted through the **tftp-server** command on the router. For configuration information, see the [“Required Configuration” section on page 18](#).

Phone Devices

Similarly, when an analog telephone adapter (ATA), such as ATA-186 is attached to the Cisco IOS Telephony Service router, the ATA receives very basic configuration information and firmware from the TFTP server XMLDefault.cnf.xml file. Access to the XMLDefault.cnf.xml file must be granted by using the **tftp-server** command on the router. The XMLDefault.cnf.xml file is automatically generated by the Cisco IOS Telephony Service router with the **ip source-address** command and is placed in the router's Flash memory. For configuration information, see the [“Required Configuration” section on page 18](#).

Provisioning

The router provides a mechanism to provision Cisco IOS Telephony Service. This provisioning interface allows you to perform the following functions:

- Assign directory numbers to the line appearances on each Cisco IP phone.
- Assign numbers to the speed-dial buttons on each Cisco IP phone.
- Assign caller identification information to each directory number.
- Assign directory numbers to phones other than Cisco IP phones attached to the system by using the standard voice-port and dial-peer configuration CLI.
- Provide dial-plan information to route calls either to public switched telephone network (PSTN) lines or voice network connections.

Hot-Plug Cisco IP Phones

The Cisco IP phones can be hot-plugged and unplugged to the Cisco IOS Telephony Service router without requiring a router reboot or manual status reset.

Music on Hold

The Music on Hold (MOH) feature supports .au and .wav format files. Music on Hold works only for G.711 on-net VoIP calls and PSTN calls. For all other calls, Tone on Hold works where the user hears a periodic beep. The internal calls between Cisco IP phones do not get Music on Hold, instead they get Tone on Hold. For configuration information, see the [“Configuring Music on Hold \(optional\)” section on page 30](#).

On-Hold Timeout Alert

This service adds an audible alert option as a reminder to the IP phone user that a call is waiting on-hold. For configuration information, see the [“Configuring On-Hold Call Notification \(optional\)” section on page 32](#).

Three-Party G.711 Conference

Cisco IOS Telephony Service supports three-party conference for local and on-net calls. To participate in the conference, all conference participants must use G.711. This service also supports conversion between G.711 u-law and a-law. The maximum number of simultaneous conferences is platform-specific. For configuration information, see the [“Configuring Three-Party G.711 Conference Calls \(optional\)” section on page 30](#).

Phone Configuration Using a GUI

The GUI interface is intended for two classes of users: the local administrators for the Cisco IOS Telephony Service router and the end users of the Cisco IP phone. For each class of users, passwords can be set to prevent unauthorized personnel from accessing or changing Cisco IOS Telephony Service router configuration and Cisco IP phone configuration. Username and password are configured through the Cisco IOS CLI or through the GUI interface. For CLI configuration for the web access, see the [“Configuring a GUI on the Router \(required\)” section on page 42](#).

Remote Control of Cisco IP Phone with Basic TAPI-Capable PC Application

Cisco IOS Telephony Service provides an interface that enables simple one-to-one remote control of a Cisco IP phone by an associated PC running CiscoIHOSTP, a Telephony Application Programming Interface (TAPI) that supports placing outbound calls from an application address and phone address book. This interface is intended to support only basic TAPI services to enable caller-ID-based screen pops for incoming calls and to support simple outgoing call placement using one-click address-book style speed-dialing from the PC application. For an introduction to the Cisco IOS Telephony Service TSP interface, see the [“Integrating Cisco IOS Telephony Service with Applications” section on page 65](#).

**Note**

This service does not add full TAPI support for multiple users or the multiple call handling required to implement complex features like automatic call distributor (ACD) or IP contact center (IPCC).

IVR Auto-Attendant

The IVR and Auto-Attendant mechanism can support the handling of inbound calls on FXO ports and outbound calls on FXS ports including analog phones configured through the plain old telephone system (POTS) and Cisco IP phones configured through the Cisco IP phone directory numbers (ephone-dn)—virtual FXS ports. The TCL scripts play prompts (welcome, phone number, store hours, and store locations), collect digits, and place calls. The IVR prompts must be downloaded on the Cisco IOS Telephony Service router’s Flash memory. The IVR prompts require an audio file (.au) format of 8-bit, u-law, and 8-KHz encoding. For configuration information, see the [“Configuring IVR Auto-Attendant \(optional\)” section on page 41](#).

Customized Script

If you want Cisco to develop customized application scripts for you, contact the Developer Support group at developer-support@cisco.com. This is a fee based service.

In addition, if you are interested in developing TCL scripts, you can join the Cisco Developer Support Program. This program provides you with a consistent level of support. It also provides an easy process to open, update, and track issues using the Online Case tracking tool available at Cisco.com. This is also a fee based service.

**Note**

To participate in the Cisco Developer Support Program, you must have a signed Developer Support Agreement. For more details and for access to this agreement, go to the following URL:

<http://www.cisco.com/warp/public/570/index.html>, or contact developer-support@cisco.com.

Voice Mail Message Waiting Indication

The message waiting indication (MWI) feature turns on the light indicator on the Cisco IP phone to inform you that you have a voice-mail message. For configuration information, see the [“Configuring Message Waiting Indication \(optional\)” section on page 53](#).

Intercom

The Cisco IOS Telephony Service supports intercom functionality for one-way and press-to-answer voice connections. This is implemented using specially configured (from CLI or web only) speed-dial buttons that allow a call to be placed to the selected directory number (DN) and to make the called DN automatically answer the call in speakerphone mode, with mute activated. An alerting beep is played to the recipient as soon as the call is auto-answered. This provides a one-way voice path from the initiator to the recipient. To respond to the intercom call and open two-way voice, the recipient presses the Mute button to deactivate the mute (or in the case of a Cisco IP Phone 7910, lifts the handset). For configuration information, see the [“Configuring Intercom \(optional\)” section on page 37](#).

Paging

The audio paging feature operates in a way similar to the intercom, but provides only one-way voice, with no press-to-answer option. A dummy DN that associates any number of local IP phones is created. The paging extension number is configured using the existing ephone-dn “number” parameter. Multiple paging DNs are supported per system. The paging number may be dialed from anywhere, including on-net calls. The paging audio stream is heard on all selected IP phones that are in the idle state, using speakerphone mode. The IP phone display shows the “name” information associated with the paging DN used to activate the page. The paging mechanism supports audio distribution using IP multicast, replicated unicast, and a mixture of both (so that multicast is used where possible, and unicast is used for specific phones that cannot be reached using multicast). For configuration information, see the [“Configuring Paging \(optional\)” section on page 38](#).

URL Provisioning

The Cisco IP Phone 7960 and the Cisco IP Phone 7940 have customized function buttons that show the phone call status and activities on the display panels. These customized function buttons also invoke programmable non-call-related services. The four buttons—services, directories, messages, and information (the i button)—are linked to appropriate feature operations through programmable URLs. For configuration information, see the [“Configuring URL Provisioning \(optional\)” section on page 31](#).

**Note**

You cannot customize the Settings button.

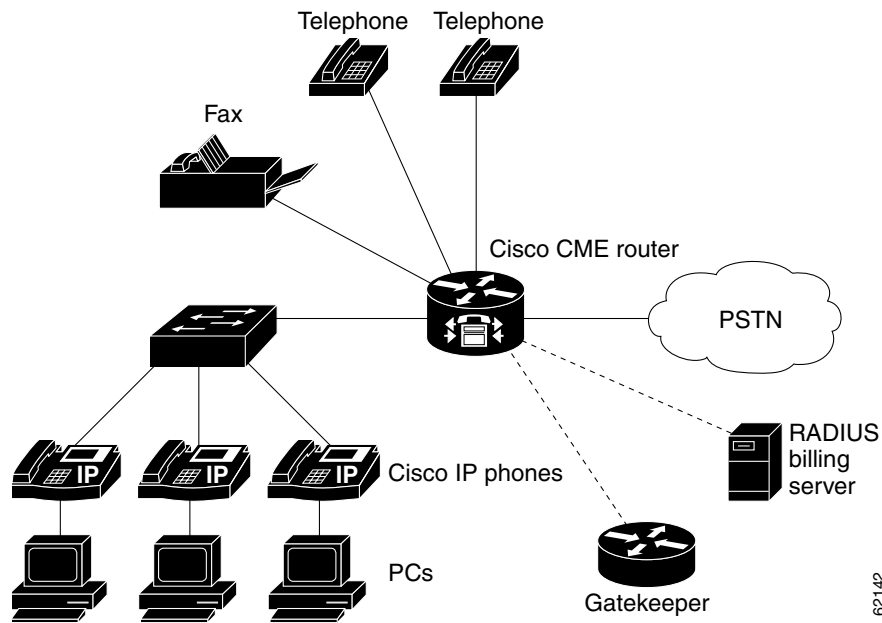
Specific URLs are provisioned on the Cisco IP phone; these URLs point to XML-based web pages formatted with XML tags that the Cisco IP phone understands and uses. When you press a function button, the Cisco IP phone uses the configured URL to access the appropriate XML web page for

instructions. The web page sends instructions to the Cisco IP phone to display information on the screen for you to navigate. You can select options and enter information by using the softkeys and the scroll button.

Cisco IOS Telephony Service Network Scenarios

Figure 1 shows a typical deployment of a Cisco IOS Telephony Service router with several Cisco IP phones connected to it. The Cisco IOS Telephony Service router is connected to the PSTN. The router can also connect to a gatekeeper and a RADIUS billing server in the same network.

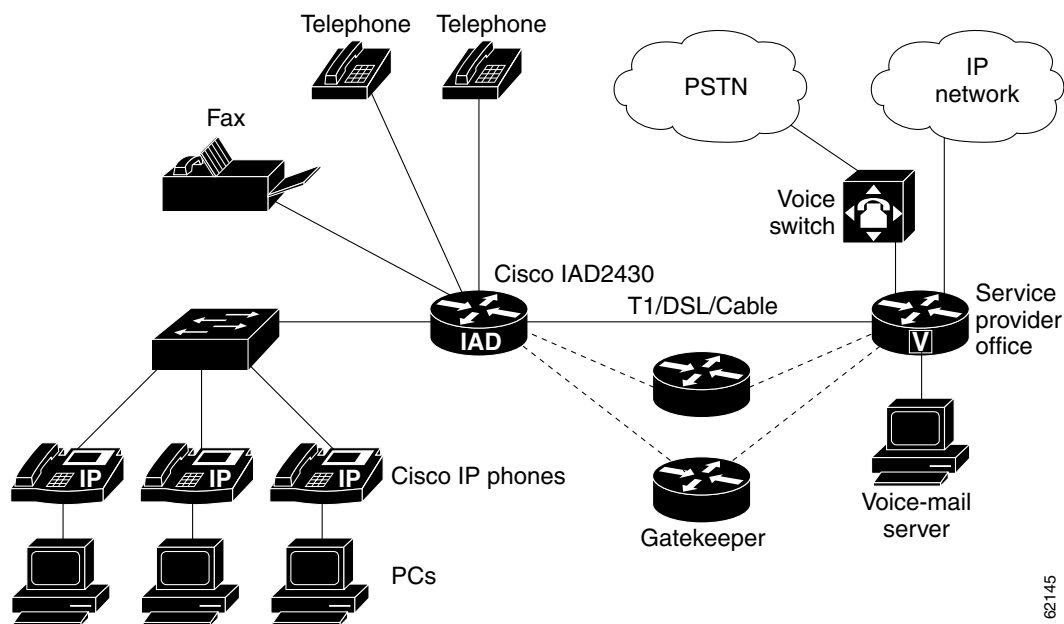
Figure 1 Cisco IOS Telephony Service for the Small and Medium Office



62142

Figure 2 shows a branch office with several Cisco IP phones connected to a Cisco IAD2420 series IAD with the Cisco IOS Telephony Service. The Cisco IAD2420 series IAD is connected to a multiservice router at a service provider office. The multiservice router at the service provider office provides connection to the WAN and PSTN.

Figure 2 Cisco IOS Telephony Service for the Service Providers



Specifications

Cisco IOS Telephony Service supports 1 to 48 telephones, depending on the Cisco platforms. The following tables list the Cisco platforms, maximum number of Cisco IP phones, maximum number of directory numbers (DNs) or virtual voice ports, memory requirements for corresponding Cisco IOS releases:

- [Table 1](#)—12.2(2)XT
- [Table 2](#)—12.2(8)T
- [Table 3](#)—12.2(11)T



Note

Although Cisco IOS can provide higher number of DN's for some of these platforms, the higher limitation may not apply in reality to your platform due to memory restrictions. We recommend that you follow the guidelines in the Specifications tables to configure your network.

Table 1 Specifications for Version 2.0 Released in 12.2(2)XT

Cisco Platform	Maximum Cisco IP Phones	Maximum DNs or Virtual Ports	Minimum DRAM Memory	Recommended DRAM Memory	Minimum Flash Memory	Recommended Flash Memory	Cisco IOS Release
Cisco 1750 routers	24	96	48 MB	48 MB	16 MB	16 MB	12.2(2)XT
Cisco 1751 routers	24	96	64 MB	64 MB	16 MB	32 MB	12.2(2)XT
Cisco 2600 series routers	24	96	64 MB	96 MB	16 MB	32 MB	12.2(2)XT
Cisco 3620 routers	24	96	64 MB	64MB	16 MB	32 MB	12.2(2)XT
Cisco IAD2420 series IADs	24	96	64 MB	64 MB	16 MB	32 MB	12.2(2)XT
Cisco 3640 routers	48	192	64 MB	96 MB	16 MB	32 MB	12.2(2)XT
Cisco 3660 routers	48	192	96 MB	128 MB	16 MB	32 MB	12.2(2)XT

Table 2 Specifications for Version 2.0 Released in 12.2(8)T

Cisco Platform	Maximum Cisco IP Phones	Maximum DNs or Virtual Ports	Minimum DRAM Memory	Recommended DRAM Memory	Minimum Flash Memory	Recommended Flash Memory	Cisco IOS Release
Cisco 1750 routers	24	96	48 MB	48 MB	16 MB	16 MB	12.2(8)T
Cisco 1751 routers	24	96	64 MB	64 MB	16 MB	32 MB	12.2(8)T
Cisco 2600 series routers	24	96	64 MB	96 MB	16 MB	32 MB	12.2(8)T
Cisco 2600-XM	24	96	128 MB	—	32 MB	—	12.2(8)T1
Cisco 2691 router	48	192	128 MB	—	32 MB	—	12.2(8)T1
Cisco 3620 routers	24	96	64 MB	64MB	16 MB	32 MB	12.2(8)T
Cisco IAD2420 series IADs	24	96	64 MB	64 MB	16 MB	32 MB	12.2(8)T
Cisco 3640 routers	48	192	64 MB	96 MB	16 MB	32 MB	12.2(8)T
Cisco 3660 routers	48	192	96 MB	128 MB	16 MB	32 MB	12.2(8)T
Cisco 3725 routers	48	192	128 MB	—	32 MB	—	12.2(8)T
Cisco 3745 routers	48	192	128 MB	—	32 MB	—	12.2(8)T

Table 3 Specifications for Version 2.01 Released in 12.2(11)T

Cisco Platform	Maximum Cisco IP Phones	Maximum DNs or Virtual Ports	Minimum DRAM Memory	Recommended DRAM Memory	Minimum Flash Memory	Recommended Flash Memory	Cisco IOS Release
Cisco 1750 routers	24	120	48 MB	48 MB	16 MB	16 MB	12.2(11)T
Cisco 1751 routers	24	120	64 MB	64 MB	16 MB	32 MB	12.2(11)T
Cisco 2600 series	24	120	64 MB	96 MB	16 MB	32 MB	12.2(11)T
Cisco 2600-XM series	24	120	128 MB	—	32 MB	—	12.2(11)T

Table 3 Specifications for Version 2.01 Released in 12.2(11)T (continued)

Cisco Platform	Maximum Cisco IP Phones	Maximum DNs or Virtual Ports	Minimum DRAM Memory	Recommended DRAM Memory	Minimum Flash Memory	Recommended Flash Memory	Cisco IOS Release
Cisco 2650-XM	48	192	128 MB	—	32 MB	—	12.2(11)T
Cisco 2691 router	48	192	128 MB	—	32 MB	—	12.2(11)T
Cisco 3620 routers	24	120	64 MB	64MB	16 MB	32 MB	12.2(11)T
Cisco IAD2420 series IADs	24	120	64 MB	64 MB	16 MB	32 MB	12.2(11)T
Cisco 3640 routers	48	192	64 MB	96 MB	16 MB	32 MB	12.2(11)T
Cisco 3660 routers	48	192	96 MB	128 MB	16 MB	32 MB	12.2(11)T
Cisco 3725 routers	48	192	128 MB	—	32 MB	—	12.2(11)T
Cisco 3745 routers	48	192	128 MB	—	32 MB	—	12.2(11)T

Features Introduced in Version 1.0

Cisco IOS Telephony Service Version 1.0 introduced the following features supported on the Cisco IP phones:

- Function keys
- Dial-plan class of restriction (COR)
- Call hold and retrieve
- Call pickup of on-hold calls
- Multiple lines per Cisco IP phone
- Multiple line appearance across telephones
- Call-forwarding functions: all, busy, and no answer
- Call transferring
- Speed dialing
- Cisco IP phones derive the date and time from the router through Network Time Protocol (NTP)
- Interworking with Cisco gatekeeper
- Distinctive ringing: for external versus internal calls
- Caller identification display and blocking
- Analog Foreign Exchange Station (FXS) and Foreign Exchange Office (FXO) ports
- On-net calls using Voice over IP (VoIP) H.323, Voice over Frame Relay (VoFR), and Voice over ATM (VoATM)

Features Introduced in Version 2.0

Cisco IOS Telephony Service Version 2.0 improves system manageability by providing a graphical user interface (GUI) using a standard web browser. Administrators who are not familiar with Cisco IOS command-line-interface (CLI) commands can now perform simple Cisco IP phone configuration

changes using the GUI; for example, telephone number changes because of employee addition or turnover. This version also adds the following additional phone and basic voice-mail integration features:

- Web browser phone administration interface
- Web browser recent call history and activity display
- Huntstop support
- Translation rule support
- Two-line support for Cisco IP Phone 7910
- Cisco IP Conference Station 7935 support
- Music on Hold (MOH)
- Three-party G.711 conference calls
- Distinctive ringing
- Voice-mail integration with Active Voice using Skinny Client Control Protocol (SCCP), including message waiting indication
- Cisco IP phone-to-phone intercom
- Cisco IP phone audio paging system
- On-hold call timeout alert
- Session Initiation Protocol (SIP) unsolicited message waiting notification support
- Local phone directory display and search on Cisco IP phone
- Cisco IP phone URL provisioning CLI
- Basic Telephony Application Programming Interface (TAPI) aware PC application support for incoming call caller-ID and outgoing call address-book dialing
- Interactive voice response (IVR) and Auto-Attendant support per Cisco IP phone directory number using Toolkit Command Language (TCL)
- Third-party H.323 call transfers

Features Introduced in Version 2.01

- Support for a greater number of connected Cisco IP phones
- Support for an increased number of directory numbers or virtual voice ports on Cisco IP phones
- ATA-186
- Top-line description for the Cisco IP Phone 7960 and Cisco IP Phone 7940

Restrictions of Cisco IOS Telephony Service

- Cisco 1750 and Cisco 1751 do not support Quality of Service (QoS) features on the asymmetric digital subscriber line (ADSL) link, Cisco Hoot and Holler over IP applications, and G.SHDSL WAN card supported in the current Cisco 1700 image sets.
- Due to memory limitations, does not support Cisco 1750 in Cisco IOS Release 12.2(11)T.

- Does not support Session initiation protocol (SIP) and Media Gateway Control Protocol (MGCP) on-net calls.
- Does not support first generation Cisco IP phones, such as Cisco IP Phone 30 VIP and Cisco IP Phone 12 SP+ are not supported.
- Does not support any more Cisco IP phones than the maximum specified number in the “Specifications” section on page 7.
- Does not support any more directory numbers than the maximum specified number in the “Specifications” section on page 7.
- Does not support Element Management System (EMS) integration.
- Does not support Cisco Voice Manager (CVM) support of IP phone configuration.
- Does not support H.450 integration for MWI and on-net call transfers.
- Does not support analog telephone call-transfer.
- Does not support transfer with consult (with H.450 call transfer support).



Note Standards-based H.323 call transfer for interworking with third-party H.323 endpoints is not supported because of lack of H.450 support.

- Call transfer is supported only on the following:
 - VoFR, VoATM, and H.323 for Cisco gateway to Cisco gateway using H.323 nonstandard information element (both gateways running Cisco IOS Release 12.2(11)T)
 - FXO and FXS loopstart (analog)
 - FXO and FXS groundstart (analog)
 - E&M (analog) and DID (analog)
 - T1 channel associated signaling (CAS) with FXO and FXS groundstart signaling
 - T1 CAS with E&M signalling
 - All PRI and BRI switch types



Note T1 CAS and PRI are not supported on the Cisco 1750 or Cisco 1751 routers.

- Does not support MGCP fallback.
- Does not support TAPI Version 2.1.



Note Cisco IOS Telephony Service Version 2.0 implements only a small subset of TAPI functionality. It does support operation of multiple independent clients (for example, one client per phone line). The TSP support does not have full TAPI support for multiple user or multiple call handling, which is required for complex features such as automatic call distribution (ACD) and IP contact center (IPCC). Also, this TAPI version does not have direct media and voice-handling capabilities.

Related Features and Documents

- [Cisco IOS Voice, Video, and Fax Configuration Guide, Release 12.2](#)
- [Cisco IOS Voice, Video, and Fax Command Reference, Release 12.2](#)
- [Cisco IOS Debug Command Reference](#)
- [Cisco IOS DHCP Server](#)
- [Getting Started with the Cisco IP Phone 7910](#)
- [Cisco IP Phone 7960 and 7940 Series At a Glance](#)
- [Quick Reference Cisco IP Phone 7910 for IOS Telephony Service Version 2.0](#)
- [Quick Reference Cisco IP Phone 7960/7940 for IOS Telephony Service Version 2.0](#)
- [TCL IVR API Version 2.0 Programmer's Guide](#)
- [Cisco 1750 Series Router Hardware Installation Guide](#)
- [Cisco 1750 Voice-over-IP Software Configuration Guide](#)
- [Cisco 1751 Router Hardware Installation Guide](#)
- [Cisco 1751 Router Software Configuration Guide](#)
- [Cisco IAD2420 Series Hardware Installation Guide](#)
- [Cisco IAD2420 Series Integrated Access Devices Software Configuration Guide](#)
- [Cisco 2600 Series Hardware Installation Guide](#)
- [Cisco 3600 Series Hardware Installation Guide](#)
- [Cisco 3700 Series Hardware Installation Guide](#)
- [Software Configuration Guide](#)

Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 series routers

Supported Platforms and Devices

- Cisco 1750 routers



Note

Due to memory limitations, Cisco 1750 is not supported in Cisco IOS Release 12.2(11)T.

- Cisco 1751 routers



Note

The Cisco 1750 and Cisco 1751 platforms do not support Quality of Service (QoS) features on the asymmetric digital subscriber line (ADSL) link, Cisco Hoot and Holler over IP applications, and G.SHDSL WAN card supported in the current Cisco 1700 image sets.

- Cisco 2600 series
- Cisco 2600XM series
- Cisco 2691 router
- Cisco 3600 series

- Cisco IAD2420 series
- Cisco 3725 routers
- Cisco 3745 routers

Cisco IP Phones

- Cisco IP Phone 7910
- Cisco IP Phone 7940
- Cisco IP Phone 7960
- Cisco IP Conference Station 7935
- ATA-186

Determining Platform Support Through Cisco Feature Navigator

Cisco IOS software is packaged in feature sets that support specific platforms. To get updated information regarding platform support for this service, access Cisco Feature Navigator. Cisco Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Cisco Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or release. Under the release section, you can compare releases side by side to display both the features unique to each software release and the features in common.

To access Cisco Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions at <http://www.cisco.com/register>.

Cisco Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

<http://www.cisco.com/go/fn>

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this service.

MIBs

No new or modified MIBs are supported by this service.

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB web site on Cisco.com at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

RFCs

No new or modified RFCs are supported by this service.

Prerequisites

- IP routing must be enabled.
- Network must be configured with DHCP.
- Cisco IOS Release 12.2(11)T or later release is required.
- Appropriate Cisco IP phone firmware versions that support the Cisco IP Phone 7960, Cisco IP Phone 7940, and Cisco IP Phone 7910 models, and Cisco IP Conference Station 7935 are required. To get the appropriate Cisco IP phone firmware versions, go to the following URL:
<http://www.cisco.com/cgi-bin/tablebuild.pl/ip-key>



Note You must purchase a feature license to turn this new feature on. You also need an account on Cisco.com to access the Cisco IP phone firmware versions.

- Memory requirements are dependent on the platform and the number of supported Cisco IP phones. See “[Specifications](#)” section on [page 7](#) for details.

Configuration Tasks

Perform the following configuration tasks on your router. Each task in the list is required.

- [Configuration Prerequisites, page 14](#)
- [Required Configuration, page 18](#)

Configuration Prerequisites

Before you start the basic configuration of Cisco IOS Telephony Service on your router, perform the following tasks. Each task in the list is required.

- [Downloading Required System Files, page 14](#)
- [Configuring DHCP for the Cisco IP Phone, page 15](#)

Downloading Required System Files

To download required image from the Software Center and to download other required system files, go to the following URL:

<http://www.cisco.com/cgi-bin/tablebuild.pl/ip-key> and perform the following tasks.



Note If you need to replace individual files, go to the following URL:
<http://www.cisco.com/cgi-bin/tablebuild.pl/ip-iostsp>

-
- Step 1** Download the desired Cisco IOS software image from Software Center to the routers’s Flash memory. Software Center button is located on the left panel.
- Step 2** Get the appropriate Cisco IP phone firmware and download the firmware file to the router’s Flash memory.

Step 3 Get the following GUI files and uncompress the two files:

- GUI_Files.tar for UNIX
- GUI_Files.zip for Windows

When you uncompress the two GUI files, you get the following files:

- admin_user.html
- telephony_service.html
- normal_user.html
- ephone_admin.html
- logohome.gif

Download the files to the router's Flash memory.

Step 4 Get the music-on-hold files and download the files to the router's Flash memory.

Step 5 Get the TCL IVR script and download the files to the router's Flash memory.

Step 6 Download the CiscoIOSTSP.zip file to a convenient location on your PC. You need the TSP files to setup individual PCs for the Cisco IP phone user. For further details, see "[CiscoIOSTSP Download and Setup](#)" section on page 66.

Configuring DHCP for the Cisco IP Phone

When the Cisco IP phone is turned on, it automatically queries for a DHCP server. Then the DHCP server responds by assigning an IP address to the Cisco IP phone. The IP address of the TFTP server is also provided through DHCP option 150. The Cisco IP phone then attempts to get the configuration file SEPDEFAULT.cnf and phone firmware from the TFTP server.



Note

The SEPDEFAULT.cnf file is autogenerated in the router's Flash memory when Cisco IOS Telephony Service is configured.

You can configure DHCP for the Cisco IP phones by performing any of the following tasks:

- [Configuring the DHCP IP Address Pool](#)
- [Configuring the DHCP IP Address for Each Cisco IP Phone](#)
- [Configuring DHCP Relay](#)

Configuring the DHCP IP Address Pool


Note

This process creates a large shared pool of IP addresses, where all DHCP clients receive the same information, including the option 150 TFTP server IP address. This can be a problem if some (non-IP phone) clients need to use a different TFTP server address.

To globally configure DHCP for all Cisco IP phones and other devices attached to the Cisco IOS Telephony Service router, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ip dhcp pool <i>pool 1</i>	Creates a name for the DHCP server address pool and enters DHCP pool configuration mode.
Step 2	Router(config-dhcp)# network <i>ip-address</i>	Specifies the IP address of the network.
Step 3	Router(config-dhcp)# option 150 ip <i>ip-address</i>	The option 150 command specifies the TFTP server address from which the Cisco IP phone downloads the image configuration file, SEPDEFAULT.cnf. This is your Cisco IOS Telephony Service router address.
Step 4	Router(config-dhcp)# default-router <i>ip-address</i>	The Cisco IP phones are directly connected to this router. This router is either a Cisco IOS Telephony Service router or any Cisco router attached to the Cisco IOS Telephony Service router. Note As long as the Cisco IP phones have connection to the Cisco IOS Telephony Service router, the Cisco IP phones are able to get the required network details.

Configuring the DHCP IP Address for Each Cisco IP Phone

To configure DHCP for each Cisco IP phone connected to the Cisco IOS Telephony Service router, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ip dhcp pool <i>phone 1</i>	Creates a name for the DHCP server address pool and enters DHCP pool configuration mode.
Step 2	Router(config-dhcp)# host <i>ip-address</i>	Specifies the IP address you want the phone to get.
Step 3	Router(config-dhcp)# client-identifier <i>mac address</i>	Specifies the MAC address of the phone. The MAC address is printed on a sticker and placed under each Cisco IP phone. Note You must use a 01 prefix number before the MAC address.
Step 4	Router(config-dhcp)# hardware address <i>mac address</i>	Specifies the hardware address.

	Command	Purpose
Step 5	Router(config-dhcp)# option 150 ip <i>ip-address</i>	Specifies the TFTP server IP address from which the Cisco IP phone downloads the image configuration file, SEPDEFAULT.cnf. This is your Cisco IOS Telephony Service router IP address.
Step 6	Router(config-dhcp)# default-router <i>ip-address</i>	Specifies the IP address of the default router. The Cisco IP phones are directly connected to this router. This router is either a Cisco IOS Telephony Service router or any Cisco router attached to the Cisco IOS Telephony Service router. Note As long as the Cisco IP phones have connection to the Cisco IOS Telephony Service router, the Cisco IP phones are able to get the required network details.

Configuring DHCP Relay



Note

By default, the Cisco IOS DHCP Server feature is enabled on your router. If the feature is disabled, enable the Cisco IOS DHCP Server feature on your router.

To configure DHCP Relay on the LAN interface where the Cisco IP phones are connected and enable the Cisco IOS DHCP Server feature, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# service dhcp	Enables the Cisco IOS DHCP Server feature on the router.
Step 2	Router(config)# interface <i>type number</i>	Enters interface configuration mode for the specified interface.
Step 3	Router(config-if)# ip helper-address <i>ip-address</i>	Specifies the helper address for any unrecognized broadcast for TFTP server and Domain Name System (DNS) server requests. For each server, a separate ip helper-address command is required if the servers are on different hosts. You can also configure multiple TFTP server targets by using the ip helper-address commands for multiple servers.

For further details about DHCP configuration, refer to the [Cisco IOS DHCP Server](#) document.

Required Configuration

See the following sections for configuration tasks for Cisco IOS Telephony Service. Each task in the list is required except the tasks that are marked as optional.

- [Configuring Cisco IOS Telephony Service Mode, page 18](#)
- [Obtaining the IP Address of the Cisco IOS Telephony Service Router, page 19](#)
- [Enabling Files on the TFTP Server, page 20](#)
- [Associating Cisco IP Phones with the Cisco IOS Telephony Service Router, page 21](#)
- [Creating Directory Numbers for Cisco IP Phones \(required\), page 22](#)
- [Configuring Each Cisco IP Phone, page 23](#)
- [Configuring Global Reset on Cisco IP Phones \(optional\), page 23](#)
- [Configuring Reset for Specific Cisco IP Phones \(optional\), page 24](#)

Configuring Cisco IOS Telephony Service Mode

To enable Cisco IOS Telephony Service, enter the following command beginning in global configuration mode to enter the telephony-service configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.

Obtaining the IP Address of the Cisco IOS Telephony Service Router

To obtain the IP address of the Cisco IOS Telephony Service router, enter the following command in telephony-service configuration mode:

	Command	Purpose
Step 1	<pre>Router(config-telephony-service)# ip source-address ip-address [port port] [any-match strict-match]</pre>	<p>Identifies the IP address and port number the Cisco IOS Telephony Service router uses for the IP phone service. The default port is 2000.</p> <p>The ip source-address command helps the router to autogenerate the SEPDEFAULT.cnf file and the XMLDefault.cnf.xml file, which are stored in the router's Flash memory. The SEPDEFAULT.cnf file contains the IP address of one of the Ethernet ports of the router to which the phone should register; the XMLDefault.cnf.xml file contains the IP address of one of the Ethernet ports of the router to which the ATA adapter should register. These files are specific to the router and cannot be shared by multiple routers.</p> <p>Use the any-match keyword to instruct the router to permit Cisco IP phone registration, and use the strict-match keyword to instruct the router to reject Cisco IP phone registration attempts if the IP server address used by the phone does not exactly match the source-address.</p> <p>Tip Make sure that the SEPDEFAULT.cnf file and the XMLDefault.cnf.xml files are registered to the TFTP server. See “Enabling Files on the TFTP Server” section on page 20.</p>

Enabling Files on the TFTP Server

When the Cisco IP phone contacts the TFTP server, it requests a configuration (SEPDEFAULT.cnf) file. The SEPDEFAULT.cnf file contains the IP address of the Cisco IOS Telephony Service router.



Tip

Make sure that the router's Flash memory contains the SEPDEFAULT.cnf file, the XMLDefault.cnf.xml file, and the appropriate phone firmware before enabling access to the phone firmware.

To enable access to the configuration file and phone firmware files on the TFTP server, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# tftp-server flash:SEPDEFAULT.cnf	<p>Enables TFTP access to the SEDEFAULT.cnf file on the TFTP server so that the Cisco IP phone can get the file.</p> <p>Note The filename is case-sensitive.</p>
Step 2	Router(config)# tftp-server flash:XMLDefault.cnf.xml	<p>(Optional) This step is required for ATA-186 to register as an analog adapter and not as an IP phone to the Cisco IOS Telephony Service router.</p> <p>Enables TFTP access to the XMLDefault.cnf.xml file on the TFTP server so that the ATA-186 can get the firmware file. All the voice ports get the XMLDefault.cnf.xml file.</p> <p>Tip For ATA features to work in ATA style, the analog phones attached to an ATA must register as ATA voice ports and not as Cisco IP phone virtual voice ports. For more details, see the ATA-186 documents. To verify the ATA voice ports, use the show ephone command to confirm the ATA registration.</p> <p>Note The filename is case-sensitive.</p>
Step 3	Router(config)# tftp-server flash:firmware	<p>Specifies the phone firmware that the Cisco IP phone can download from the TFTP server.</p> <p>If you are using the Cisco IP Phone 7960, the Cisco IP Phone 7940, the Cisco IP Phone 7910, and Cisco IP Conference Station 7935, enter the tftp-server flash: command and specify the phone firmware for the Cisco IP phone to download.</p> <p>Note You must manually copy all the phone firmware files to the Flash memory of the Cisco IOS Telephony Service router.</p>

Associating Cisco IP Phones with the Cisco IOS Telephony Service Router

Before associating the Cisco IP phones, see “[Specifications](#)” section on page 7 to find out the maximum number of Cisco IP phones you can have on your Cisco IOS Telephony Service router.

To associate Cisco IP phones with the Cisco IOS Telephony Service router, enter the following commands in telephony-service configuration mode:

	Command	Purpose
Step 1	Router(config-telephony-service)# max-ephones <i>max phones</i>	Configures the maximum number of Cisco IP phones supported by the Cisco IOS Telephony Service router. The default is 0. The maximum number of IP phones is platform dependent. See “ Specifications ” section on page 7 for details. Note You can increase the number of phones; but after the maximum allowable number is configured, you cannot reduce the maximum number without rebooting the router.
Step 2	Router(config-telephony-service)# max-dn <i>max directory number</i>	Configures maximum number of directory numbers supported by the Cisco IOS Telephony Service router. The default is 0. The maximum directory number is platform dependent. See “ Specifications ” section on page 7 for details. Note You can increase the directory numbers; but after the maximum allowable number is configured, you cannot reduce the maximum number without rebooting the router.
Step 3	Router(config-telephony-service)# load {7960-7940 7910 7935} <i>firmware</i>	Identifies the Cisco IP phone firmware used by the Cisco IP phone type. You must enter this command for each type of phone. Note The Cisco IP Phone 7960 and Cisco IP Phone 7940 have the same phone firmware. Note When you enter the load command, you do not use the extension of the file; for example, .bin. Timesaver ATA does not use the load command. For details see “ Enabling Files on the TFTP Server ” section on page 20.

Creating Directory Numbers for Cisco IP Phones (required)

To create directory numbers for Cisco IP phones, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configure the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. See the “Specifications” section on page 7.
Step 2	Router(config-ephone-dn)# number <i>number</i> [secondary <i>number</i>] [no-reg [both primary]]	Configures a valid number for the Cisco IP phone. The secondary keyword allows you to associate a second telephone number with an ephone-dn so that the IP phone line can be called by dialing either the main or the secondary phone number. Unless you specify one of the option keywords (both or primary) after the no-reg keyword, the secondary number is not registered.
Step 3	Router(config-ephone-dn)# name <i>name</i>	Configures a username associated with a directory number. You must follow the pattern specified in the directory command in telephony-service configuration mode to associate the usernames for the directory. The pattern for the usernames for the directory is set either with first-name-first or last-name-first .

Configuring Each Cisco IP Phone



Note

Each Cisco IP phone must be configured individually on the Cisco IOS Telephony Service router to receive support in the LAN environment. You must assign a number to the phone lines by entering the **ephone-dn** command and then you configure each physical Cisco IP phone by entering the **ephone** command.

To register each Cisco IP phone on the Cisco IOS Telephony Service router, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone tag	Enters ephone (Ethernet phone) configuration mode to register Cisco IP phones. The maximum Cisco IP phone limit is platform dependent. See the “Specifications” section on page 7.
Step 2	Router(config-ephone)# mac-address mac-address	Specifies the MAC address of the registering phone.
Step 3	Router(config-ephone)# button button-number:dn-tag button-number:dn-tag	Assigns a button number to the Cisco IP phone directory number. The argument <i>button-number:dn-tag</i> , for example, can use the values 1:1, 2:4, or 3:14. In this example, button 1 corresponds to directory number 1 (ephone-dn 1), button 2 corresponds to directory number 4, and button 3 corresponds to directory number 14. The buttons correspond to the phone lines on the Cisco IP phone.

Configuring Global Reset on Cisco IP Phones (optional)

To globally reset the Cisco IP phones associated with the Cisco IOS Telephony Service router after the required configuration is complete, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# reset {all seconds mac-address mac-address}	Resets the Cisco IP phone associated with the Cisco IOS Telephony Service router. Use the all keyword to reset all Cisco IP phones specifying the time interval using the <i>seconds</i> argument. The range is from 0 to 15 seconds. There is no default. Use the mac-address keyword to reset a specific Cisco IP phone.

Configuring Reset for Specific Cisco IP Phones (optional)

To reset a specific Cisco IP phone after the required configuration is complete, enter the following commands in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone tag	Enters ephone configuration mode to register Cisco IP phones.
Step 2	Router(config-ephone)# reset	Resets a specific Cisco IP phone in ephone configuration mode.

Verification and Troubleshooting

- [Verifying Cisco IOS Telephony Service Configuration, page 24](#)
- [Troubleshooting the Cisco IOS Telephony Service Router, page 24](#)

Verifying Cisco IOS Telephony Service Configuration

To verify that the Cisco IOS Telephony Service is enabled, follow these steps:

-
- Step 1** Enter the **show run** command to verify the configuration.
 - Step 2** Enter the **show telephony-service all** command to verify that Cisco IOS Telephony Service router is enabled.
 - Step 3** Verify that DHCP is configured.
 - Step 4** Verify that TFTP is configured.
 - Step 5** Enter the **dir** command to verify that the SEPDEFAULT.cnf file, XMLDefault.cnf.xml file, and the phone firmware files are stored in the router's Flash memory.
 - Step 6** Enter the **show ephone [mac-address]** command to verify all Cisco IP phones in the network.
-

Troubleshooting the Cisco IOS Telephony Service Router

To troubleshoot the Cisco IOS Telephony Service router, perform the following steps:

-
- Step 1** Enter the **show ephone** command to display all registered phones. If no phones are registered, then perform the following tasks:
 - a. Configure the Cisco IOS Telephony Service router.
 - b. Check DHCP configuration, including the default router and the TFTP server address (option 150).
 - c. Use the **dir** command to check that the required files are in the router's Flash memory.
 - d. Check that the **tftp-server** command is set for the required files.
 - e. Use the **debug ephone register mac-address** command to display Cisco IP phone registration activity.
 - f. Use the **debug ip dhcp** command to confirm DHCP operation.

- Step 2** Enter the **show ephone command** to display all registered phones. If phones are registered and are displayed, then perform the following:
- Check that the phone button binding to the directory number is correct.
 - Check that the Cisco IP phones show as registered.
 - Verify the IP parameter settings on the Cisco IP phone, using the Settings display on the phone.
 - Check that the keepalive count is being updated when you enter the **show ephone** command.
 - Reset the phone and observe the re-registration by entering the **debug ephone register mac-address** command to display the Cisco IP phones.
 - Enter the **show ephone-dn summary** command to check the state of the Cisco IP phone lines.
 - Check the IP address of the phone and attempt to ping the address.
- Step 3** Use the **debug ephone keepalive** command to set keepalive debugging for the Cisco IP phones.
- Step 4** Use the **debug ephone state** command to set state debugging for the Cisco IP phones.
-

To troubleshoot other areas of the Cisco IOS Telephony Service router, use the following commands:

- To set detail debugging for a Cisco IP phone, use the **debug ephone detail** command.
- To set error debugging for a Cisco IP phone, use the **debug ephone error** command.
- To set message waiting indication (MWI) debugging for a Cisco IP phone, use the **debug ephone mwi** command.
- To set call statistics debugging for a Cisco IP phone use the **debug ephone statistics** command
- To provide voice-packet-level debugging and print the contents of one voice packet in every 1024 voice packets, use the **debug ephone pak** command.
- To provide raw low-level protocol debugging display for all SCCP messages, use the **debug ephone raw** command.
- To provide debugging for local directory search, use the **debug ip http token** command
- To troubleshoot HTTP authentication problems, use the **debug ip http authentication** command
- To show the URLs accessed from the router, use the **debug ip http url** command.
- To display HTTP server transaction processing, use the **debug ip http transaction**

For further debugging, you can use the **debug** commands in the [Cisco IOS Debug Command Reference](#), Cisco IOS Release 12.2.

Additional Configuration Tasks

See the following sections for additional configuration tasks for Cisco IOS Telephony Service. Each task in the list is optional.

- [Configuring Date and Time \(optional\), page 27](#)
- [Configuring Dial-Plan Pattern \(optional\), page 27](#)
- [Configuring Local Directory \(optional\), page 28](#)
- [Configuring Keepalive \(optional\), page 28](#)
- [Configuring Interdigit Timeout \(optional\), page 29](#)

- [Configuring Three-Party G.711 Conference Calls \(optional\), page 30](#)
- [Configuring Music on Hold \(optional\), page 30](#)
- [Enabling Transfer of Calls \(optional\), page 31](#)
- [Configuring URL Provisioning \(optional\), page 31](#)
- [Configuring Speed-Dial \(optional\), page 32](#)
- [Configuring On-Hold Call Notification \(optional\), page 32](#)
- [Configuring Preference \(optional\), page 33](#)
- [Configuring Class of Restriction \(optional\), page 34](#)
- [Configuring Call Forward \(optional\), page 34](#)
- [Configuring Caller-ID Blocking \(optional\), page 35](#)
- [Applying Translation Rule \(optional\), page 35](#)
- [Disabling and Reenabling Huntstop \(optional\), page 36](#)
- [Enabling a Top-Line Description, page 36](#)
- [Configuring Intercom \(optional\), page 37](#)
- [Configuring Paging \(optional\), page 38](#)
- [Configuring IVR Auto-Attendant \(optional\), page 41](#)

Configuring Date and Time (optional)

To configure date and time format, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# date-format { mm-dd-yy dd-mm-yy }	Sets the date display format on all Cisco IP phones attached to the router. The default is set to mm-dd-yy .
Step 3	Router(config-telephony-service)# time-format { 12 24 }	Sets the time display format on all Cisco IP phones attached to the router. The default is set to 12 hours.

Configuring Dial-Plan Pattern (optional)

To configure a dial-plan pattern, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# dialplan-pattern <i>tag pattern extension-length length [no-reg]</i>	Creates a global prefix that can be used to expand the abbreviated extension numbers into fully qualified E.164 numbers. The extension-length keyword enables the system to convert a full E.164 telephone number back to an extension number for the purposes of caller-ID display, received, and missed call lists. The no-reg keyword provides dialing flexibility and prevents the E.164 numbers in the dial peer from registering to the gatekeeper. You have the option not to register some specific numbers to the gatekeeper so that those numbers can be used for other telephony services.

Configuring Local Directory (optional)

To configure the local directory, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# directory { first-name-first last-name-first }	<p>Defines the local directory naming order and points to the directory access to an HTTP location.</p> <p>Note The actual directory of names and phone numbers is built using the name command and the number command under ephone-dn configuration mode.</p> <p>When the command is set with the first-name-first keyword, you see the directory information displayed on the phone, for example, Jane E. Smith; and when the command is set with the last-name-first keyword, you see the directory information displayed on the phone, for example, Smith, Jane E.</p>

Configuring Keepalive (optional)

To configure sending keepalive messages, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# keepalive <i>seconds</i>	Configures the time interval between sending keepalive messages to the router used by the Cisco IP phones. The range is 10 to 65,535 seconds. The default keepalive is set at 30 seconds, so the keepalives are sent every 30 seconds.

Configuring Interdigit Timeout (optional)

To configure interdigit timeout value for all Cisco IP phones, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# timeouts interdigit seconds	<p>Configures the interdigit timeout value for all Cisco IP phones attached to the router.</p> <p>The interdigit timeout specifies the number of seconds that the system waits after the caller has entered the initial digit or a subsequent digit of the dialed string. If the timeout ends before the destination is identified, a tone sounds and the call ends. This value is important when using variable-length dial peer destination patterns (dial plans). For more information on setting dial plans, see the “Configuration Dial Plans, Dial Peers, and Digit Manipulation” chapter of the <i>Cisco IOS Voice, Video, and Fax Configuration Guide, Release 12.2</i>.</p> <p>The <i>seconds</i> argument is the interdigit timeout wait time in seconds. A valid entry is an integer from 2 to 120 seconds. The default is 10 seconds.</p>

Configuring Three-Party G.711 Conference Calls (optional)

To configure three-party G.711 conference calls for the Cisco IOS Telephony Service router, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# max-conferences <i>max-conference numbers</i>	<p>Sets the maximum number of simultaneous three-party conferences supported by the router. The default is half of the maximum simultaneous three-party conferences per platform.</p> <p>The maximum number of simultaneous three-party conferences supported by the router is platform dependent:</p> <ul style="list-style-type: none"> • Cisco 1750—8 • Cisco 1751—8 • Cisco 2600 series—8 • Cisco 2600-XM series—8 • Cisco 3620—8 • Cisco IAD2420 series—8 • Cisco 3640—8 • Cisco 3660—16 • Cisco 3725—16 • Cisco 3745—16

Configuring Music on Hold (optional)

The Music on Hold (MOH) feature supports .au and .wav format files. Music on Hold works only for G.711 on-net VoIP calls and PSTN calls. For all other calls, Tone on Hold works where the user hears a periodic beep. The internal calls between Cisco IP phones do not get Music on Hold, instead they get Tone on Hold.

To configure Music on Hold), enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# moh <i>filename</i>	<p>Configures Music on Hold.</p> <p>Note The music file should be in the router's Flash memory. This file should be in G.711 format. The files can be in .wav or .au file format; however, the file format must contain 8-bit 8KHz data; for example, CCITT a-law or u-law data format.</p>

Enabling Transfer of Calls (optional)

To enable call transfer between Cisco IP phones and non-IP phones, enter the following commands beginning in telephony-service configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# transfer-pattern <i>transfer-pattern</i>	Allows transfer of telephone calls to other non-IP phone numbers.

Configuring URL Provisioning (optional)

The Cisco IP Phone 7960 and Cisco IP Phone 7940 can support four URLs in association with the four programmable feature keys on the IP phones. The four feature keys on the IP phone: *directories*, *information*, *messages*, and *services* are configured using the keywords. The fifth key—*settings*—is managed entirely by the phone. Operation of these services is determined by the IP phone capabilities and the content of the referenced URL.

To configure URL provisioning, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# url { directory information messages services } <i>url</i>	<p>Provisions URLs for use by the Cisco IP phones. The four keywords, directory, information, messages, and services correspond with the four feature keys on the IP phone: <i>directories</i>, <i>information</i>, <i>messages</i>, and <i>services</i>. The purpose of the url command is simply to provision the URLs through the SEPDEFAULT.cnf configuration file supplied by the Cisco IOS Telephony Service router to the Cisco IP phones during phone registration. The maximum character length for the URL is 128.</p> <p>You can disable local directory by entering url directories none. You need to reset the Cisco IP phones before the url command can take effect.</p> <p>Note By default, the router automatically uses the local directory service. Provisioning the directory URL to select an external directory resource disables the Cisco IOS Telephony Service local directory service.</p>

Configuring Speed-Dial (optional)

To configure speed-dial for numbers that are used frequently, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone <i>tag</i>	Enters ephone configuration mode to register Cisco IP phones. The maximum number of Cisco IP phones is platform dependent. For details, see the “ Specifications ” section on page 7.
Step 2	Router(config-ephone)# speed-dial <i>button-number</i> <i>directory-number</i>	Sets speed-dial buttons on a Cisco IP phone. Note Although 20 speed dials can be configured on the Cisco IP phone, ATA phones support only 9 speed-dials with Cisco IOS Telephony Service: *1, *2, *3,*4,*5,*6,*7,*8, and *9.

Configuring On-Hold Call Notification (optional)

To configure on-hold audible notification on the Cisco IP phone to alert the user about on-hold calls, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. For details, see the “ Specifications ” section on page 7.
Step 2	Router(config-ephone-dn)# number <i>number</i>	Configures a valid directory number for the Cisco IP phone that receives on-hold call notification.

	Command	Purpose
Step 3	Router(config-ephone-dn)# name <i>name</i>	Assigns the IP phone number a name for display.
Step 4	Router(config-ephone-dn)# hold-alert <i>timeout</i> { idle originator shared }	<p>Sets audible alert notification on the Cisco IP phone for alerting the user about on-hold calls. The <i>timeout</i> parameter specifies the time interval in seconds from the time the call is placed on hold to the time the on-hold audible alert is generated. The alert is repeated at the end of the set <i>timeout</i>.</p> <p>When the idle keyword is enabled, a one-second burst of ringing on the phone is generated on the IP phone that placed the call into the hold state, only if the phone is in the idle state. If the phone is in active use, no on-hold alert is generated.</p> <p>When the originator keyword is enabled, a one-second burst of ringing is generated on the phone that placed the call into the hold state if the phone is in the idle state. If the phone is in use on another call, an audible beep is generated (call-waiting tone).</p> <p>Note From the perspective of the originator of the call on-hold, the shared and the originator keywords provide the same functionality.</p> <p>When the shared keyword is enabled, a one second ring burst is generated for all the idle phones which share the same line appearance. If the phones are in use, they do not get an audio beep alert. Only the phone that initiated the call, if busy, hears a call-waiting beep.</p>

Configuring Preference (optional)

To configure preference, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. For details, see the “Specifications” section on page 7.
Step 2	Router(config-ephone-dn)# preference <i>preference-order</i>	Sets preference for the attached dial peer for a directory number. The range is from 0 to 10. The default is 0.

Configuring Class of Restriction (optional)

Class of restriction (COR) is used to specify which incoming dial peer can use which outgoing dial peer to make a call. Each dial peer can be provisioned with an incoming and an outgoing COR list.

To configure COR on the dial peers associated with a directory number, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. For details, see the “Specifications” section on page 7 .
Step 2	Router(config-ephone-dn)# cor { incoming outgoing } <i>cor-list-name</i>	Configures a class of restriction (COR) on the dial peers associated with a directory number. For more information on setting COR, see the “Configuring Dial Peer Matching Features” section in the “Configuration Dial Plans, Dial Peers, and Digit Manipulation” chapter of the <i>Cisco IOS Voice, Video, and Fax Configuration Guide, Release 12.2</i> .

Configuring Call Forward (optional)

To configure forwarding calls to other Cisco IP phones, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. For details, see the “Specifications” section on page 7 .
Step 2	Router(config-ephone-dn)# number <i>number</i>	Configures a valid directory number for the Cisco IP phone that receives on-hold call notification.
Step 3	Router(config-ephone-dn)# call-forward all <i>directory-number</i>	Configures call-forwarding for all incoming calls on one of the lines of a Cisco IP phone to another telephone.
Step 4	Router(config-ephone-dn)# call-forward busy <i>directory-number</i>	Configures call-forwarding to another number when the Cisco IP phone is busy.
Step 5	Router(config-ephone-dn)# call-forward noan <i>directory-number timeout seconds</i>	Configures call-forwarding to another number when no answer is received from the Cisco IP phone. The timeout keyword sets the waiting time before the call is forwarded to another phone. The time is set in seconds. The range is 3 to 60,000. Note It is mandatory to specify and enter a timeout number in seconds, otherwise an error message "incomplete command" will appear on the console.

Configuring Caller-ID Blocking (optional)

To configure caller-ID blocking for outbound calls from a Cisco IP phone, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. For details, see the “Specifications” section on page 7.
Step 2	Router(config-ephone-dn)# caller-id block	Configures caller-ID blocking for outbound calls originated from the ephone-dn. This commands requests that the far-end gateway device blocks display of the calling party information, for calls received by the far-end gateway from the ephone-dn. This configuration does not affect the ephone-dn calling party information display for inbound calls received by the ephone-dn. By default, caller ID is not blocked on calls originating from the Cisco IP phone.

Applying Translation Rule (optional)

Translation rules are a powerful general purpose number manipulation mechanism supported by Cisco IOS software that can be used to perform operations such as automatically adding telephone area and prefix codes to dialed numbers. The translation rules are applied to the voice ports created by the ephone-dn.

To apply a translation rule to numbers dialed by Cisco IP phone users, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. For details, see the “Specifications” section on page 7.
Step 2	Router(config-ephone-dn)# translate { called calling } <i>translation-rule-tag</i>	Selects a translation rule to numbers dialed by Cisco IP phone users. The called keyword translates the called number, and the calling keyword translates the calling number. Note Appropriate translation rules should be created on the VoIP configuration level, for the translate command to take effect. The <i>translation-rule-tag</i> argument is the reference number of the translation rule. Valid entries are 1 to 2,147,483,647. For further details, see the “Configuration Dial Plans, Dial Peers, and Digit Manipulation” chapter of the <i>Cisco IOS Voice, Video, and Fax Configuration Guide, Release 12.2</i> .

Disabling and Reenabling Huntstop (optional)


Note

In ephone-dn configuration mode, huntstop is set by default.

To disable or to reenabling huntstop, enter the following commands in ephone-dn configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. For details, see the “Specifications” section on page 7 .
Step 2	Router(config-ephone-dn)# no huntstop	Disables huntstop.
Step 3	Router(config-ephone-dn)# huntstop	Enables huntstop.

Enabling a Top-Line Description

To enable a alphanumeric description label in the top black bar on the display screen for a Cisco IP Phone 7960 and Cisco IP Phone 7940 connected to a Cisco IOS Telephony router, use the following commands beginning in global configuration mode.

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
Step 2	Router(config-ephone-dn)# number <i>number</i>	Configures a valid number for the Cisco IP phone.
Step 3	Router(config-ephone-dn)# description <i>text-string-with-spaces</i>	Enables a alphanumeric description label in the top black bar on the display screen for a Cisco IP Phone 7960 and Cisco IP Phone 7940. The <i>text-string-with-spaces</i> argument is a meaningful alphanumeric text string up to 16 characters in length, including spaces. Note Although 32 characters can fit in the top line of the phone display, we recommend using 16 characters. If more than 16 characters are used, the extra characters will erase the existing time and date display in the black bar.

The following example shows the configuration for a top black bar description for ephone-dn 5 which is associated with extension number 8001:

```
ephone-dn 5
  number 8001
  description 408 555 1212
```

Configuring Intercom (optional)

The intercom configuration dedicates a pair of ephone-DNs for use as a “press to talk” two-way intercom between two IP phones. Intercom lines cannot be used in shared-line configurations. If an ephone-dn is configured for intercom operation, it must be associated to one IP phone only. The intercom attribute causes an IP phone line (ephone-dn) to operate as auto-dial for outbound calls and auto-answer-with-mute for inbound calls.

To configure intercom, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines. The maximum directory number is platform dependent. For details, see the “Specifications” section on page 7 .
Step 2	Router(config-ephone-dn)# number <i>number</i>	Configures a valid intercom number for the Cisco IP phone that receives the intercom.
Step 3	Router(config-ephone-dn)# name <i>name</i>	Configures a username associated with a directory number to receive the intercom. “Intercom” is used in place of the <i>name</i> argument.
Step 4	Router(config-ephone-dn)# intercom <i>directory number</i> [barge-in no-auto-answer] [label <i>label</i>]	Defines the directory number for the Cisco IP phone that connects with another IP phone for the intercom feature. The intercom command dedicates a pair of ephone-DNs for use as a “press to talk” two-way intercom between two IP phones. The barge-in keyword allows inbound intercom calls to force an existing call into the call-hold state and allows the intercom call to be immediately answered. The no-auto-answer keyword creates a connection for the IP phone line resembling private line automatic ringdown (PLAR). The label keyword defines a text label for the intercom.
Step 5	Router(config-ephone-dn)#	Repeat Steps 1 to Step 4 for the second Cisco IP phone that requires the intercom feature. Note For the intercom feature to work, you must configure both Cisco IP phones.
Step 6	Router(config-ephone-dn)# exit	Exits ephone-dn configuration mode.
Step 7	Router(config)# ephone <i>tag</i>	(Optional) Enters ephone configuration mode to register Cisco IP phones.
Step 8	Router(config-ephone)# button <i>button-number:dn-tag</i> <i>button-number:dn-tag</i> <i>button-number:dn-tag</i>	(Optional) Assigns a button number to the Cisco IP phone directory number. The argument <i>button-number:dn-tag</i> , for example, can use the values 1:1, 2:4, and 3:14. The third set ephone tag 3 is set to the intercom directory number 14, so that the third button (directory number) is set to receive the intercom.

The following example shows intercom configuration between two Cisco IP phones:

```

ephone-dn 18
 number A5001
 name "intercom"
 intercom A5002 barge-in

ephone-dn 19
 name "intercom"
 number A5002
 intercom A5001 barge-in

ephone 4
 button 1:2 2:4 3:18

ephone 5
 button 1:3 2:6 3:19

```

In this example, directory number (ephone-dn) 18 and directory number (ephone-dn) 19 are set as an intercom pair. Directory number (DN) 18 is associated with button 3 of Cisco IP phone (ephone) 4 and directory number (DN) 19 is associated with button number 3 of Cisco IP phone (ephone) 5. Button 3 on both Cisco IP phone 4 and Cisco IP phone 5 are set as a pair to provide intercom service to each other.

Configuring Paging (optional)

To configure paging, complete the following tasks:

- [Configuring Paging for a Single Group, page 38](#)
- [Configuring Paging for Multiple Groups, page 40](#)

Configuring Paging for a Single Group

The paging feature configures the ephone-dn number to act as an extension number to broadcast unicast audio paging to idle Cisco IP phones. Cisco IP phones must be associated with the ephone-dn tag number of the paging ephone-dn, or need to be included indirectly through a paging group from another paging ephone-dn. The audio paging feature operates in a similar fashion to intercom, but provides only one-way voice, with no press-to-answer option. A directory number (DN) is created, which associates the IP phone as part of a paging group.

To configure paging for a single group of phones in your network—for example, for one department—enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
Step 2	Router(config-ephone-dn)# number <i>number</i>	Configures a valid directory number for the Cisco IP phone that receives paging.
Step 3	Router(config-ephone-dn)# name <i>name</i>	Assigns the paging number a name for display.

	Command	Purpose
Step 4	Router(config-ephone-dn)# paging [ip <i>multicast-address</i> port <i>udp-port-number</i>]	Sets paging numbers that can be called in order to broadcast an audio page to a group of Cisco IP phones. The paging command configures the ephone-dn number to act as an extension number to broadcast unicast audio paging to idle Cisco IP phones. When the optional keyword ip followed by the <i>multicast-address</i> argument and port is configured, the paging is set for multicast paging. If an IP multicast address is not configured, IP phones are paged individually using IP unicast transmission (to a maximum of 10 IP phones). The recommended operation is with an IP multicast address. When multiple paging extensions are configured, each extension uses a unique IP multicast address.
Step 5	Router(config-ephone-dn)# exit	Exits ephone-dn configuration mode and returns to global configuration mode.
Step 6	Router(config)# ephone <i>tag</i>	Enters ephone configuration mode to register Cisco IP phones. This adds IP phones to the paging group.
Step 7	Router(config-ephone)# paging-dn <i>paging-dn number tag {multicast unicast}</i>	Sets audio paging directory number for each Cisco IP phone. The paging extension number is configured using the existing ephone-dn configuration number command. The paging mechanism supports audio distribution using IP multicast, replicated unicast, and a mixture of both (so that multicast is used where possible, and allows unicast to specific phones that cannot be reached through multicast).
Step 8	Router(config-ephone)#	Repeat steps 6 and 7 to add more phones to the paging group.

The configuration example follows:

```

ephone-dn 20
  number 2000
  paging ip 224.0.1.20 port 2000

ephone-dn 21
  number 2001
  paging ip 224.0.1.21 port 2000

ephone 1
  button 1:1
  paging-dn 20

ephone 2
  button 1:2
  paging-dn 20

ephone 3
  button 1:3
  paging-dn 21

ephone 4
  button 1:4
  paging-dn 21

```

In this example paging calls to 2000 are multicast to Cisco IP phones 1 and 2, and paging calls to 2001 go to Cisco IP phones 3 and 4.

Configuring Paging for Multiple Groups

To configure paging for multiple groups of phones in your network—for example—for combining several departments like Marketing, Engineering, or Finance, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
Step 2	Router(config-ephone-dn)# number <i>number</i>	Configures a valid directory number for the Cisco IP phone that receives paging.
Step 3	Router(config-ephone-dn)# name <i>name</i>	Assigns the paging number a name for display. The value of the <i>name</i> argument can be “paging all,” “marketing,” or “paging managers-only group”, and so on.
Step 4	Router(config-ephone-dn)# paging [ip <i>multicast-address</i> port <i>udp port number</i>]	Sets paging numbers that can be called to broadcast an audio page to a group of Cisco IP phones. The paging command configures the ephone-dn number to act as an extension number to broadcast unicast audio paging to idle Cisco IP phones. IP phones must be associated with the DN tag number of the paging ephone-dn, or are included indirectly through a paging group from another paging ephone-dn. When the optional keyword ip followed by the <i>multicast-address</i> argument and port is used, the paging is set for multicast paging. If an IP multicast address is not configured, IP phones are paged individually using IP unicast transmission (to a maximum of 10 IP phones). The recommended operation is with an IP multicast address. When multiple paging extensions are configured, each extension should use a unique IP multicast address.
Step 5	Router(config-ephone-dn)# paging group <i>paging ephone-dn tag-list, paging ephone-dn tag-list</i>	Sets the audio paging directory number for a large combined group. The paging group command is used to combine small sets of phones associated with individual paging ephone-dns into a large combined group so that a page can be sent to large numbers of phones at once. Note Configure the paging command for all DNs in the group prior to configuring the paging group command. Use of paging groups allows phones not only to participate in a small local paging set (for example, paging to four phones in a company’s “shipping and receiving” department) but also to support company-wide paging when needed (for example, by combining the paging sets for shipping and receiving, with paging sets for accounting, service and sales into a paging group). The argument <i>paging ephone-dn tag-list</i> is a comma-separated list of paging group tags that are each configured as paging directory numbers. You can include up to 10 paging ephone-dn tags separated by commas; for example, 4, 6, 7, 8.

The following example shows how to set paging groups:

```
ephone-dn 20
 number 2000
 paging ip 224.0.1.20 port 2000

ephone-dn 21
 number 2001
 paging ip 224.0.1.21 port 2000

ephone-dn 22
 number 2002
 paging ip 224.0.2.22 port 2000
 paging group 20,21

ephone 1
 button 1:1
 paging-dn 20

ephone 2
 button 1:2
 paging-dn 20

ephone 3
 button 1:3
 paging-dn 21

ephone 4
 button 1:4
 paging-dn 21

ephone 5
 button 1:5
 paging-dn 22
```

In this example, paging calls to 2000 go to ephones 1 and 2, and paging calls to 2001 go to ephones 3 and 4. Calls to 2002 go to ephones 1, 2, 3, 4, and 5. Ephones 1 and 2 are included into paging ephone-dn 22 through membership of ephone-dn 20 in the paging group. Ephones 3 and 4 are included into paging ephone-22 through membership of ephone-dn 21 in the paging group. Ephone 5 is directly included as using paging-dn 22.

Configuring IVR Auto-Attendant (optional)

To configure IVR for the Cisco IOS Telephony Service router, see the “Configuring TCL IVR Applications” chapter of the *Cisco IOS Voice, Video, and Fax Configuration Guide*, Release 12.2.

The following example shows how to configure IVR for the Cisco IOS Telephony Service router:

```
call application voice auto_att_flash flash://vespa_aa_ipks_2.4.tcl
call application voice auto_att_flash aa-pilot 6000
call application voice auto_att_flash operator 21111
call application voice auto_att_flash language 1 en
call application voice auto_att_flash set-location en 0 flash://
```

To configure an application for the Cisco IP phone directory number, enter the following commands beginning in global configuration command:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone.
Step 2	Router(config-ephone-dn)# application <i>application-name</i>	Assigns a TCL IVR application to the Cisco IP phone directory number (DN).

The following example shows how to configure an application for a particular Cisco IP phone directory number:

```
ephone-dn 1
 application <application name> = auto_att_flash
```

The following example shows how to configure an application for a POTS dial peer:

```
dial-peer voice 100 pots
 application <application name> = auto_att_flash
```

The following example shows how to configure an application for a voice dial peer:

```
dial-peer voice 100 voip
 application <application name> = auto_att_flash
```

Advanced Configuration Tasks

- [Configuring a Graphical User Interface, page 42](#)
- [Integrating Voice Mail, page 50](#)
- [DTMF Integration with Legacy Voice-Mail Devices \(optional\), page 63](#)
- [Integrating Cisco IOS Telephony Service with Applications, page 65](#)

Configuring a Graphical User Interface

The Cisco IOS Telephony Service graphical user interface (GUI) provides you with comprehensive management features to help configure and maintain the Cisco IOS Telephony Service router. It also provides limited features for end users of the Cisco IP phones. As the administrator, you must set up a username and password for yourself to allow administrator-level login to the GUI and you must set up the username and password for the Cisco IP phone end user to allow end-user level login to the GUI.

See the following sections for configuration tasks for the GUI. Each task in the list is identified as either required or optional.

- [Configuring a GUI on the Router \(required\), page 42](#)
- [Getting Started with the GUI \(required\), page 44](#)

Configuring a GUI on the Router (required)

To configure the Cisco IOS Telephony Service router for GUI, perform the following tasks:

- [Enabling an HTTP Server on Cisco IOS Software, page 43](#)

- [Setting Up GUI, page 43](#)

Enabling an HTTP Server on Cisco IOS Software

The HTTP server in Cisco IOS is disabled; so to use GUI, you must enable the HTTP server. To access the GUI through the web browser, perform the following tasks in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ip http server	Enables the Cisco web browser user interface on the local Cisco IOS Telephony Service router.
Step 2	Router(config)# ip http path flash	Sets the base HTTP path for HTML files.

Setting Up GUI

To set up a username and password for yourself to allow administrator-level login to the GUI and to set up the username and password for the Cisco IP phone end users, enter the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# admin-username <i>username</i>	Sets username for the local system administrator of the Cisco IOS Telephony Service. The default username is Admin.
Step 3	Router(config-telephony-service)# admin-password <i>password</i>	Sets a password for the local system administrator of the Cisco IOS Telephony Service.
Step 4	Router(config-telephony-service)# dn-webedit	Enables adding of directory numbers through a web interface.
Step 5	Router(config-telephony-service)# time-webedit	Enables setting time through the web interface. This allows the local system administrator to change and set time on the Cisco IOS Telephony Service router.
Step 6	Router(config-telephony-service)# exit	Exits from telephony-service configuration mode.
Step 7	Router(config)# ephone tag	Enters ephone configuration mode to register Cisco IP phones.
Step 8	Router(config-ephone)# username <i>username</i> password <i>password</i>	Assigns a phone user login account name and password. This allows individual phone users to log in to the Cisco IOS Telephony Service router through a web interface and change their personal settings.



Note

After completing the GUI configuration, access the GUI for the Cisco IOS Telephony Service through the web browser.

Getting Started with the GUI (required)

To access the Cisco IP phones through the GUI interface on the Cisco IOS Telephony Service router complete the following tasks:

- [Logging In as the Administrator, page 44](#)
- [Setting Up for the Cisco IP Phone End User, page 47](#)

Logging In as the Administrator

**Note**

Make sure that the GUI configuration is completed on the router side.

You can assign, modify, or delete usernames and passwords through the GUI interface. You can also assign and modify Cisco IP phones and directory numbers for an end user.

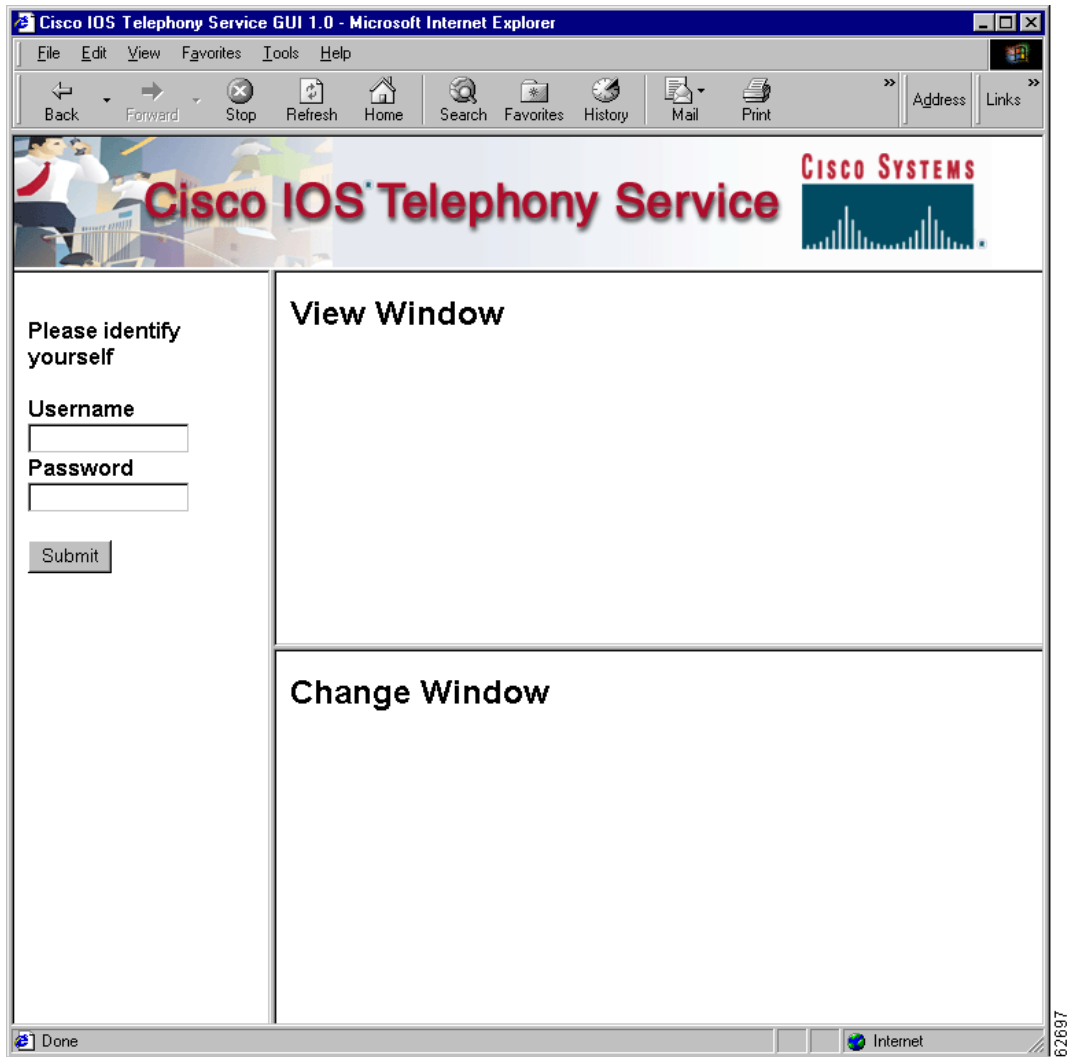
To access the GUI, complete the following steps:

-
- Step 1** Access the GUI for the Cisco IOS Telephony Service by going to the following URL:
`http://ip_address/telephony_service.html`
where *ip_address* is the router IP address of the Cisco IOS Telephony Service router.
- Step 2** When you go to the `telephony_service.html` page, you see the window shown in [Figure 3](#). Enter your username and password, and click **Submit**.

**Note**

The window shown in [Figure 3](#) is the common login page for you and the Cisco IP phone end user.

Figure 3 Cisco IOS Telephony Service GUI Login Page

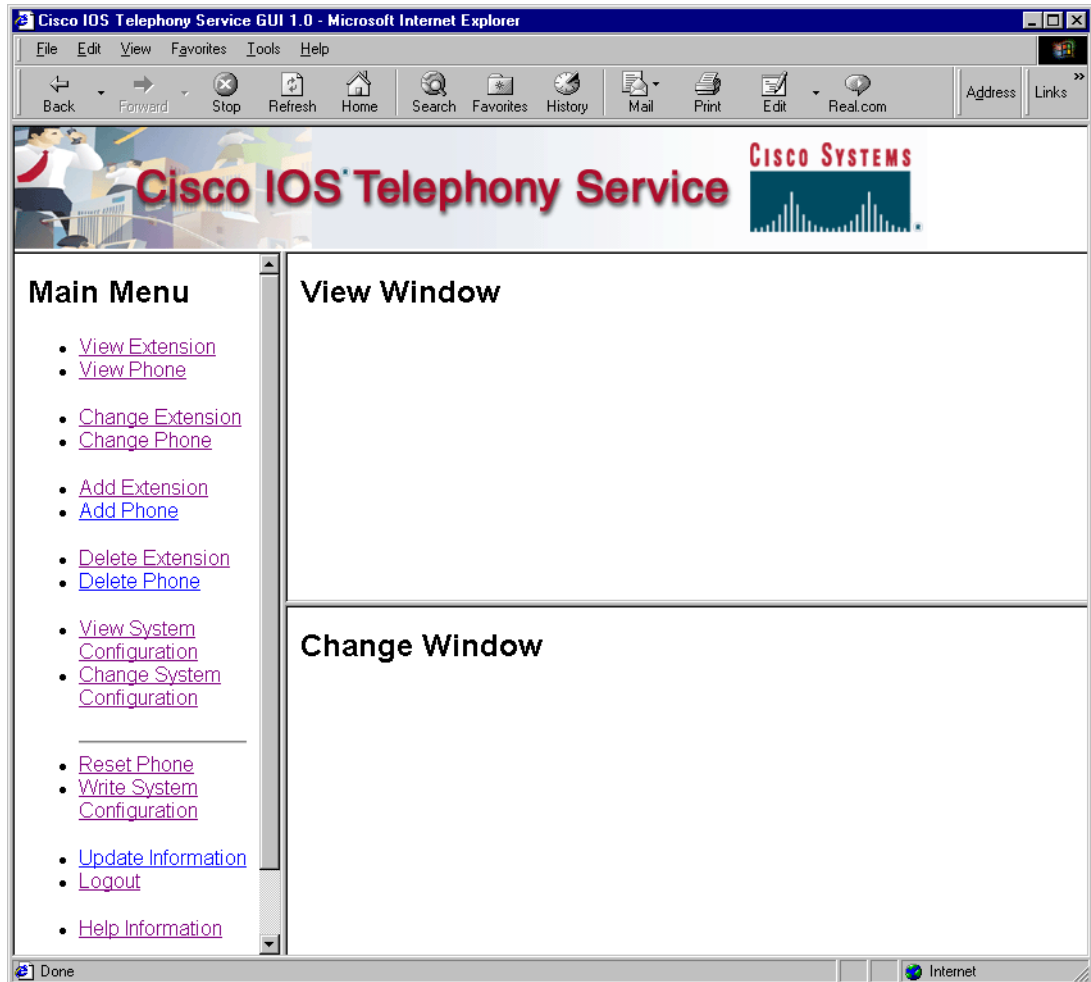


After you identify yourself as the administrator and enter the correct username and password, you see the window shown in [Figure 4](#). This is the Cisco IOS Telephony Service Home Page for the administrator. You can use all the options from the Main Menu.

**Tip**

For information on a specific page, click **Help Information**. The links work only in the Microsoft Internet Explorer browser, version 5.5 and later versions.

Figure 4 Cisco IOS Telephony Service Home Page for the Administrator



Setting Up for the Cisco IP Phone End User

As the administrator, you also must set a username and password for each Cisco IP phone end user. After you have assigned a username and password for the end user, the user can log in to the GUI to change the password, search local telephone numbers, and change speed-dial settings for the user's IP phone.

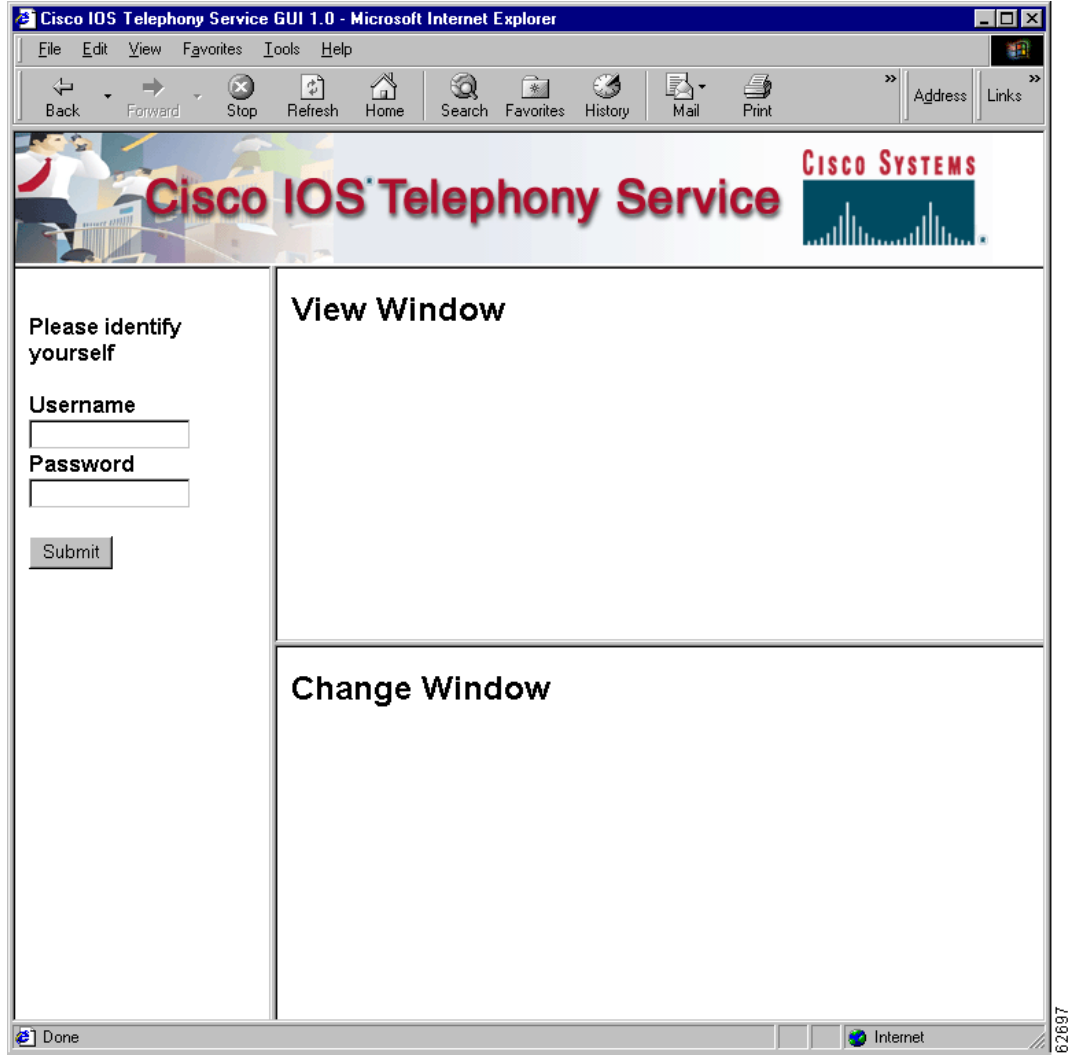
To provide GUI access to the Cisco IP phone end user, complete the following steps:

-
- Step 1** Access the GUI interface for the Cisco IOS Telephony Service by going to the following URL:
`http://ip_address/telephony_service.html`
where *ip_address* is the router IP address of the Cisco IOS Telephony Service router.
- Step 2** When you go to the `telephony_service.html` page, you see the window shown in [Figure 5](#). To provide the Cisco IP phone user personal login and initial password, enter the username and initial password of the end user and click **Submit** to log in as the end user.



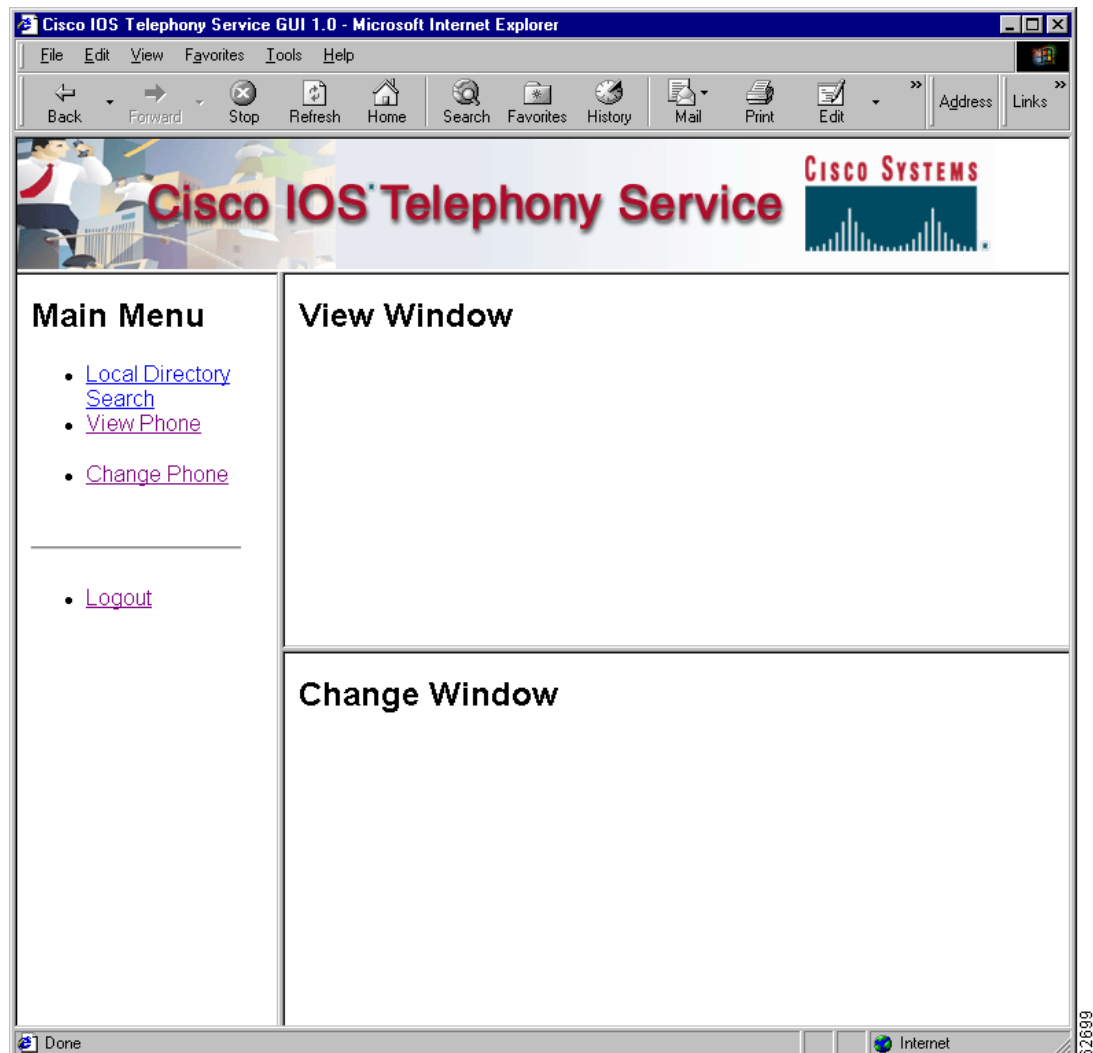
Note The window shown in [Figure 5](#) is the common login window for you and the Cisco IP phone end user.

Figure 5 Cisco IOS Telephony Service GUI Login Window



When the Cisco IP phone users log in to the GUI, they see the window as shown in [Figure 6](#). This page allows the Cisco IP phone users to change the password, search local telephone numbers, and change speed-dial settings for their individual IP phone.

Figure 6 Cisco IOS Telephony Service GUI User Main Window



Verifying GUI Configuration



Note

The configuration changes made on the GUI automatically reset and change the settings on the Cisco IP phone.

Check the Cisco IP phone display screen to verify each configuration change made on the GUI interface.

Integrating Voice Mail

The Cisco Unity Voice Mail system supports voice-mail integration with the Cisco IOS Telephony Service. If you want voice-mail integration, you must configure the Cisco IOS Telephony Service router for voice mail and then configure the Cisco Unity software on the PC to get voice-mail service.

See the following sections for configuration tasks for integrating voice mail. Each task in the list is identified as either required or optional.

- [Configuring an Access Number for Voice Mail \(required\), page 50](#)
- [Configuring the Router for Cisco Unity Voice Mail \(required\), page 50](#)
- [Associating a Voice Mail Device \(required\), page 52](#)
- [Configuring Message Waiting Indication \(optional\), page 53](#)
- [Configuring Cisco Unity TSP \(required\), page 59](#)
- [Configuring Cisco Unity Ports \(required\), page 61](#)

Configuring an Access Number for Voice Mail (required)

You must configure an access number to connect to the voice-mail system. This number is required for any kind of voice-mail integration.



Note

The same number is configured on all the Cisco IP phone directory number to connect to voice mail. For more information, see “[Configuring the Router for Cisco Unity Voice Mail \(required\)](#)” section on [page 50](#).

To configure the telephone number that is speed-dialed when the message button on a Cisco IP phone is pressed, enter the following commands beginning in telephony-service configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# voicemail <i>phone-number</i>	Configures the telephone number that is speed-dialed when the <i>messages</i> button on a Cisco IP phone is pressed to dial in to a configured voice-mail system.

Following is an example of the configuration:

```
telephony-service
  voicemail 4001
```

Configuring the Router for Cisco Unity Voice Mail (required)

To configure a voice-mail system on a Cisco IOS Telephony Service router, you allocate and configure one or more Cisco IP phone directory numbers (DN) to link your Cisco IOS Telephony Service router to your voice-mail system. Use a Cisco IP phone DN and configure it with the same access number for the voice-mail (configured in telephony-service configuration mode), for example 4001. This configuration is required for all voice-mail system integration, including Cisco Unity Voice Mail.

To create virtual voice-mail ports, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
Step 2	Router(config-ephone-dn)# number <i>number</i>	Configures a valid directory number for voice mail.
Step 3	Router(config-ephone-dn)# name <i>name</i>	Configures a username associated with voice mail and MWI. For example, specify "Voice mail" or "MWI only" as the <i>name</i> .
Step 4	Router(config-ephone-dn)# no huntstop	Disables huntstop.
Step 5	Router(config-ephone-dn)# preference <i>preference order</i>	Sets preference for the attached dial peer for a directory number. The default is 0.

The following is a typical configuration example:

```
ephone-dn 32
 number 4001
 name "VOICEMAIL1"
 no huntstop
 preference 0
!
ephone-dn 33
 number 4001
 name "VOICEMAIL2"
 no huntstop
 preference 1
!
ephone-dn 34
 number 4001
 name "VOICEMAIL3"
 no huntstop
 preference 2
!
ephone-dn 35
 number 4002
 name "MWI ONLY"
```

In the example above, there are four ephone-dns configured to provide four voice-mail access ports. Three of the ephone-dns are configured with the same extension number to provide ports dedicated for leaving and retrieving voice messages. The fourth ephone-dn is provided for use as a MWI access port. The first three ephone-dns are configured with the same extension number (4001), using preferences 0, 1, and 2; so if the first port is busy, the call goes to the second port, and so on. Port 4 is configured with the extension number 4002 and is used for MWI dial-out notification by the Cisco Unity Voice Mail system. Separate access ports are required for voice access and MWI access to prevent problems with call collision between voice calls placed by the Cisco IOS Telephony Service to the Cisco Unity Voice Mail system, and MWI calls placed in the opposite direction.

Associating a Voice Mail Device (required)

To associate the actual voice-mail device (vm-device-id) to the phone number, associate the Cisco IP phone with the voice-mail device.



Note

The default vm-device-id name is CiscoUM-VI and it should match the Device name prefix configuration on the Cisco Unity Telephony Service Provider (TSP) side. You also must complete the configuration on the TSP side.

To associate a voice-mail device to the Cisco IOS Telephony Service router, enter the following tasks beginning in ephone configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone tag	Enters ephone configuration mode to register Cisco IP phones.
Step 1	Router(config-ephone)# vm-device-id id-string	Defines the voice-mail ID string. For example, CiscoUM-VI1 for the first port and CiscoUM-VI2 for the second port, and so on. The default is CiscoUM-VI1.
Step 2	Router(config-ephone)# button button-number:dn-tag	Assigns a button number to the Cisco IP phone directory number. The argument <i>button-number:dn-tag</i> , for example, can use the values 1:1, 2:4, or 3:14. In this example, button 1 corresponds to directory number 1 (ephone-dn 1), button 2 corresponds to directory number 4, and button 3 corresponds to directory number 14. The buttons correspond to the phone lines on the Cisco IP phone.

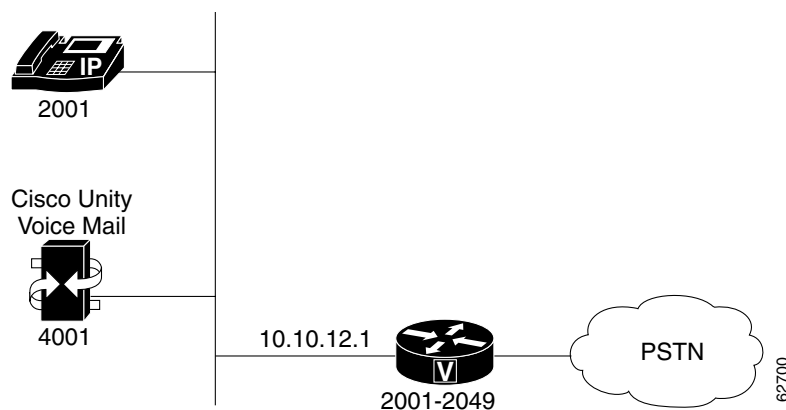
Following is an example of the configuration. In this example, the vm-device-id is used within the ephone configuration in place of the mac-address parameter that is used for configuring a regular Cisco IP phone:

```
ephone 5
  vm-device-id CiscoUM-VI1
  button 1:32
!
ephone 6
  vm-device-id CiscoUM-VI2
  button 1:33
!
ephone 7
  vm-device-id CiscoUM-VI3
  button 1:34
!
ephone 8
  vm-device-id CiscoUM-VI4
  button 1:35
```

Configuring Message Waiting Indication (optional)

The message waiting indication (MWI) mechanism turns on the light indicator on Cisco IP phones to inform you that you have a voice-mail message. [Figure 7](#) shows a network with a Cisco IP phone and a Cisco IOS Telephony Service router connected to a Cisco Unity Voice Mail system.

Figure 7 Basic MWI Network



To configure the MWI mechanism, perform the following tasks:

- [Configuring the SIP-Based MWI Server, page 53](#)
- [Configuring MWI for Each Directory Number, page 54](#)
- [Configuring a Directory Number for MWI Notification, page 54](#)
- [Configuring MWI Relay, page 56](#)

Configuring the SIP-Based MWI Server

To configure the IP address and port for the SIP-based message waiting indication (MWI) server, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# mwi sip-server ip-address [[transport tcp transport udp] [port port number] [reg-e164]]	Configures the IP address and port for the SIP-based message waiting indication (MWI) server in the same LAN as the voice-mail server. The MWI SIP server is a Cisco IOS Telephony Service router. This IP address is used in conjunction with the mwi sip command in ephone configuration mode to subscribe individual ephone-dn extension numbers to the MWI SIP server's notification list. SIP MWI client runs TCP as default. The transport tcp keyword is the default setting. The transport udp keyword allows you to integrate with the SIP MWI client. The port keyword is used to specify a port number. The default SIP port number is 5060. The default registration is with an extension number, so the reg-e164 keyword allows you to register with an E.164 10 digit number.

Configuring MWI for Each Directory Number

To configure message waiting indication (MWI) notification for each directory number (DN), use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
Step 2	Router(config-ephone-dn)# number <i>number</i>	Configures a valid directory number for the Cisco IP phone that receives the MWI notification.
Step 3	Router(config-ephone-dn)# name <i>name</i>	Configures a username associated with a directory number to receive MWI notification. For example, "MWI" is used in place of the <i>name</i> argument.
Step 4	Router(config-ephone-dn)# mwi sip	Subscribes an extension in a Cisco IOS Telephony Service router to receive message waiting indication (MWI) notification from a SIP MWI server. This integrates a Cisco IOS Telephony Service router with an MWI service based on SIP protocol. Note The mwi sip-server command under telephony-service configuration mode should be set prior to enabling the mwi sip command in ephone configuration mode.

Configuring a Directory Number for MWI Notification

MWI integration on the Cisco IOS Telephony Service router is performed by dedicating Cisco IP phone directory numbers (ephone-DNs) to process MWI status notification calls originating from the Cisco Unity Voice Mail system. You must allocate a minimum of one MWI processing ephone-dn for each MWI ephone-dn access port. The MWI processing ephone-dn extension numbers are configured to match the MWI dial-out notification numbers configured on the Cisco Unity Voice Mail system.

To configure MWI notification for an individual DN attached to the Cisco IOS Telephony Service router, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# ephone-dn <i>dn-tag</i>	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

Command	Purpose
Step 2 Router(config-ephone-dn)# number <i>number</i> [secondary <i>number</i>]	Configures a valid number for the Cisco IP phone. The secondary keyword allows you to associate a second telephone number with an ephone-dn so that the IP phone line can be called by dialing either the main or the secondary phone number. Note Two numbers should be set for the MWI mechanism to work. The first number turns the MWI light to ON and the second number turns the MWI light to OFF when the message is picked up by the IP phone user.
Step 3 Router(config-ephone-dn)# mwi { on off on-off }	Configures specific Cisco IP phone directory numbers to receive message waiting indication (MWI) notification from an external voice-mail system. The MWI notification is set for all the IP phones connected to the Cisco IOS Telephony Service router. The external voice-mail systems are often able to communicate MWI status by making telephone calls to dummy extension numbers, where the MWI information is embedded in either the called or calling party IP phone number. Note This command cannot be configured unless the number command is configured under ephone-dn configuration mode.

Following is a configuration example:

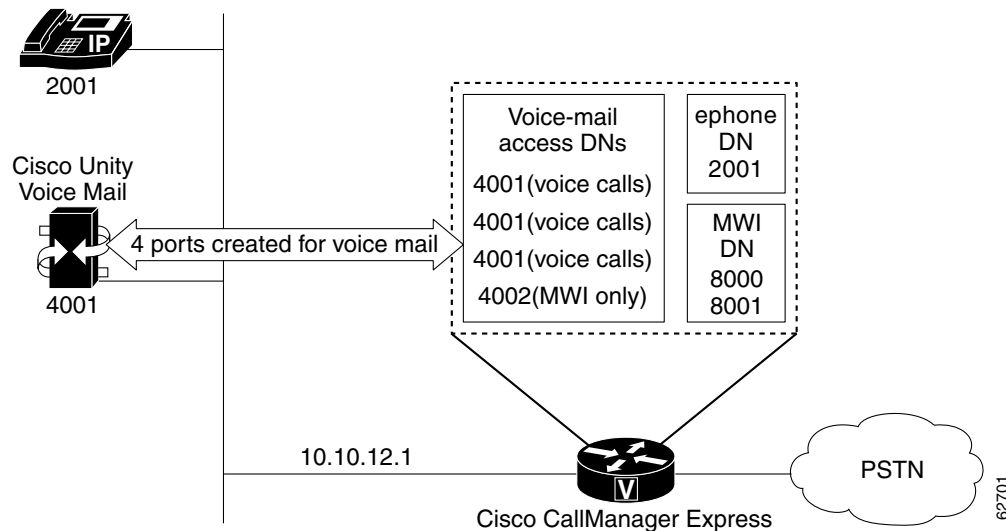
```
ephone-dn 32
number 8000 secondary 8001
mwi on-off
```

In the example above, the Cisco Unity Voice Mail system places MWI notification calls to the extension numbers 8000 and 8001 to activate and de-activate message waiting lights. The DN responds to calls placed to extension numbers 8000 and 8001, and trigger a MWI ON event when 8000 is called, and a MWI OFF event when 8001 is called.

MWI Mechanism

The MWI mechanism is initiated after someone leaves a voice-mail message. The internal MWI mechanism of the Cisco IOS Telephony Service router is explained in [Figure 8](#).

Figure 8 MWI Mechanism



In the network topology in [Figure 8](#), the following takes place:

1. The Cisco IP phone with the extension 2001 receives a call and the call is not answered.
2. The Cisco IP phone with the extension 2001 forwards the call to the voice-mail access port 4001.
3. The Cisco Unity Voice Mail system (extension 4001) stores the new message for extension 2001.
4. The Cisco Unity Voice Mail then places an MWI notification call to the MWI processing ephone-dn 8000 (through the MWI access port 4002) with the calling party ID for the notification call set to 2001.
5. The Cisco IOS Telephony Service directory number (DN) 8000 accepts the MWI notification call and switches on the message waiting light for extension 2001.

The Cisco IOS Telephony Service router can convey MWI information to the Cisco IP phone DN's if the Cisco IP phones are associated with the router.

If the Cisco IP phones are not associated with the Cisco IOS Telephony Service router connected to the Cisco Unity Voice Mail system, the MWI information is conveyed by using the MWI relay feature. For further details, see the [“Configuring MWI Relay”](#) section on page 56.

Configuring MWI Relay

MWI relay is required when one Cisco Unity Voice Mail system is shared by multiple Cisco IOS Telephony Service routers. All Cisco IOS Telephony Service routers can do MWI relay using the SIP subscriber and notifier mechanism. [Figure 9](#) shows a network topology with MWI relay mechanism. The Cisco IOS Telephony Service router attached to the Cisco Unity Voice Mail system, running the SIP MWI relay server, is the SIP notifier and the other remote Cisco IOS Telephony Service routers are the SIP subscribers.

To configure MWI relay notification to individual IP phones attached to remote Cisco IOS Telephony Service routers, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# telephony-service	Enters telephony-service configuration mode.
Step 2	Router(config-telephony-service)# mwi relay	Enables the Cisco IOS Telephony Service router to relay MWI information to remote Cisco IP phones.
Step 3	Router(config-telephony-service)# mwi expires <i>seconds</i>	Sets the expire timer for registration for either the client or server.
Step 4	Router(config-telephony-service)# mwi sip-server <i>ip-address</i> [[transport tcp transport udp] [port <i>port number</i>] [reg-e164]]	Configures the IP address and port for the SIP-based message waiting indication (MWI) server in the same LAN as the voice-mail server. The MWI SIP server is a Cisco IOS Telephony Service router. This IP address is used with the mwi sip command in ephone configuration mode to subscribe individual ephone-dn extension numbers to the MWI SIP server's notification list. SIP MWI client runs TCP as default. The transport tcp keyword is the default setting. The transport udp keyword allows you to integrate with SIP MWI client. The port keyword is used to specify a port number. The default SIP port number is 5060. The default registration is with an extension number, so the reg-e164 keyword allows you to register with an E.164 ten digit number.

The following example shows the MWI configuration for the central site Router 1, the MWI notifier:

```
telephony-service
  mwi relay
  mwi expires 8600
```

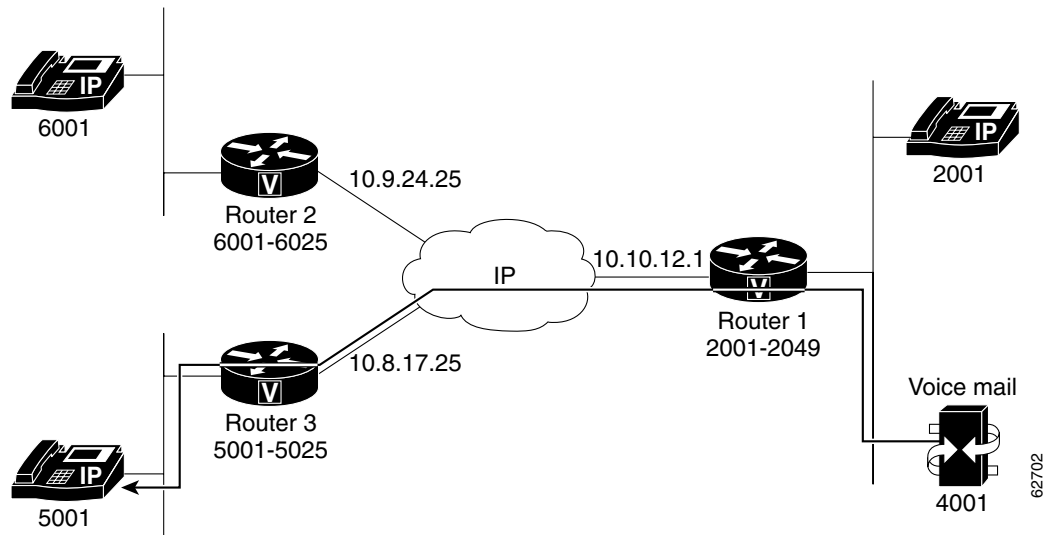
The MWI SIP configuration should be added for each directory number (DN) on the remote router that requires MWI service. For more information, see the [“Configuring the SIP-Based MWI Server” section on page 53](#). The following is a configuration example for a remote Cisco IOS Telephony Service router, Router 2, the MWI subscriber:

```
telephony-service
  mwi sip-server 1.10.12.1
  !
ephone-dn 1
  number 6001
  mwi sip
  !
```

When a voice-mail system has MWI information for any extension local or remote, it dials the central site Cisco IOS Telephony Service router. When the central site receives the MWI information, it attempts to find out whether the extension is local to the central site. If it cannot find the extension, it passes the MWI information to its notifier interface of SIP MWI. If the notifier interface on central site has the extension as a subscriber, it relays the MWI information to the remote Cisco IOS Telephony Service router.

In [Figure 9](#), Router 1 is the central site Cisco IOS Telephony Service router—the MWI notifier—and uses the MWI integration mechanism described earlier to interface with the Cisco Unity Voice Mail system. The Cisco IP phone directory numbers on Router 2 and Router 3 register with Router 1 by using the SIP subscriber mechanism. Router 1 as the SIP notifier recognizes the Cisco IP phone directory numbers associated with Router 2 and Router 3 to relay MWI.

Figure 9 Network with MWI Relay



MWI Relay Mechanism

The MWI relay mechanism is initiated after someone leaves a voice-mail message on the remote voice-mail message system. In the network topology in [Figure 9](#), the following takes place:

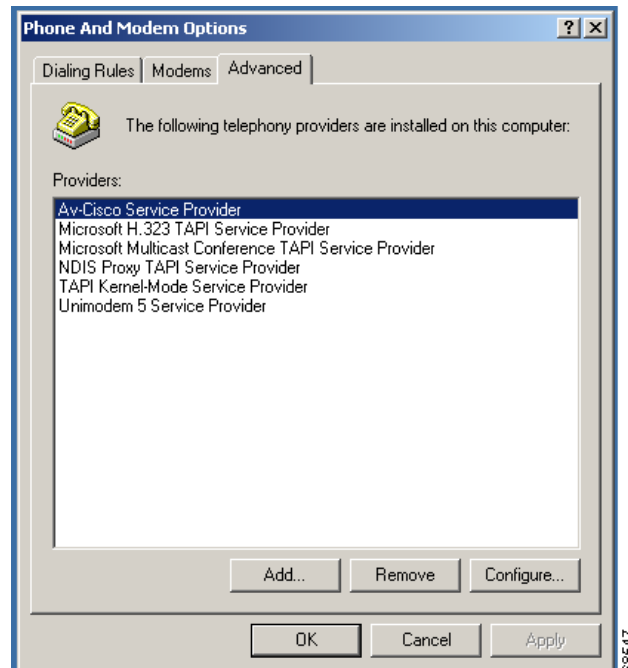
1. The Cisco IP phone with the extension 5001 receives a call and the call is not answered.
2. The Cisco IP phone with the extension 5001 forwards the call to the voice-mail access port 4001.
3. The Cisco Unity Voice Mail system (extension 4001) stores the new message for extension 5001.
4. Cisco Unity Voice Mail then places a MWI notification call to the MWI processing ephone-dn 8000 (through the MWI access port 4002) to the central Cisco IOS Telephony Service router, Router 1, with the calling party ID for the notification as extension 5001.
5. Router 1, acting as the SIP notifier, relays MWI notification to Router 3, one of the SIP subscribers.
6. Router 3, the local Cisco IOS Telephony Service router for extension 5001, turns the MWI light to ON on the Cisco IP phone 5001.

Configuring Cisco Unity TSP (required)

To configure Cisco Unity Voice Mail software, perform the following steps:

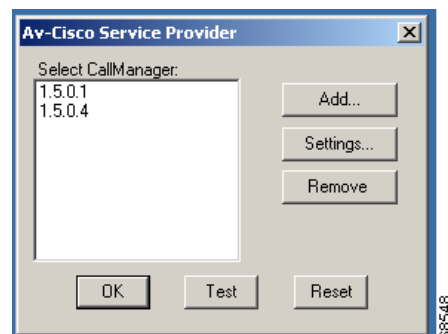
- Step 1** Go to the **Start>Settings>Control Panel>Phone and Modem Options** and the Phone and Modem Options window appears. Click on the **Advanced** tab and select **Av-Cisco Service Provider** and click **Configure**, shown in [Figure 10](#) and the Av-Cisco Service Provider window appears, shown in [Figure 11](#).

Figure 10 Phone and Modem Options Window



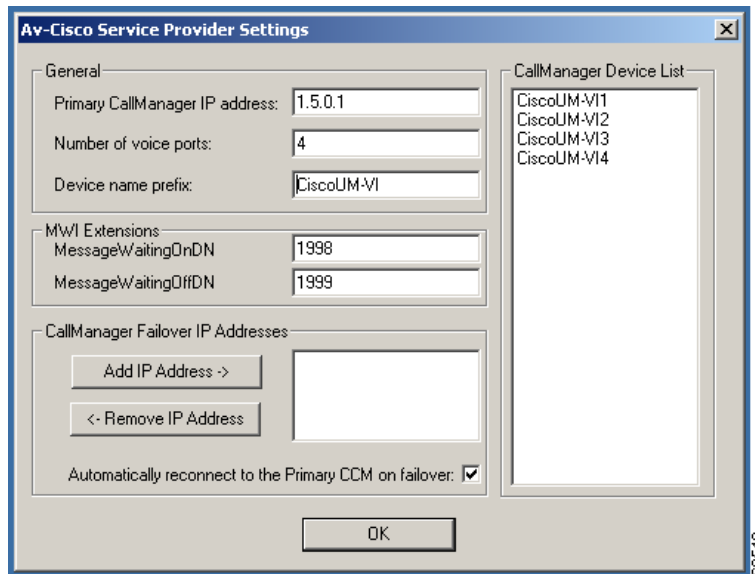
- Step 2** Add the IP address of the Cisco IOS Telephony Service router in the Av-Cisco Service Provider dialog box, shown in [Figure 11](#). Click **OK**.

Figure 11 Av-Cisco Service Provider Dialog Box



Step 3 In the Av-Cisco Service Provider Settings dialog box, shown in [Figure 12](#), perform the following steps.

Figure 12 Av-Cisco Service Provider Settings Dialog Box



- a. Confirm the IP address of the Cisco IOS Telephony Service router.
- b. Confirm the number of Cisco Unity ports.
- c. Confirm the Device name prefix. The default name is CiscoUM-VI. The voice-mail device name must match the device name configured on the Cisco IOS Telephony Service router.
- d. Enter the directory numbers next to MessageWaitingOnDN and MessageWaitingOffDN.



Note These directory numbers must match the extension numbers configured on the Cisco IOS Telephony Service router.

- e. Confirm that the CallManager Device List displays the correct number of Cisco Unity Ports.
- f. Click **OK**.

Step 4 The Av-Cisco Service Provider dialog box, shown in [Figure 11](#) reappears. Click **Test**. If you do not receive an error message, click **OK**.

Step 5 Restart Cisco Unity.

Step 6 To modify any configuration, repeat Step 1 through Step 4.

Configuring Cisco Unity Ports (required)



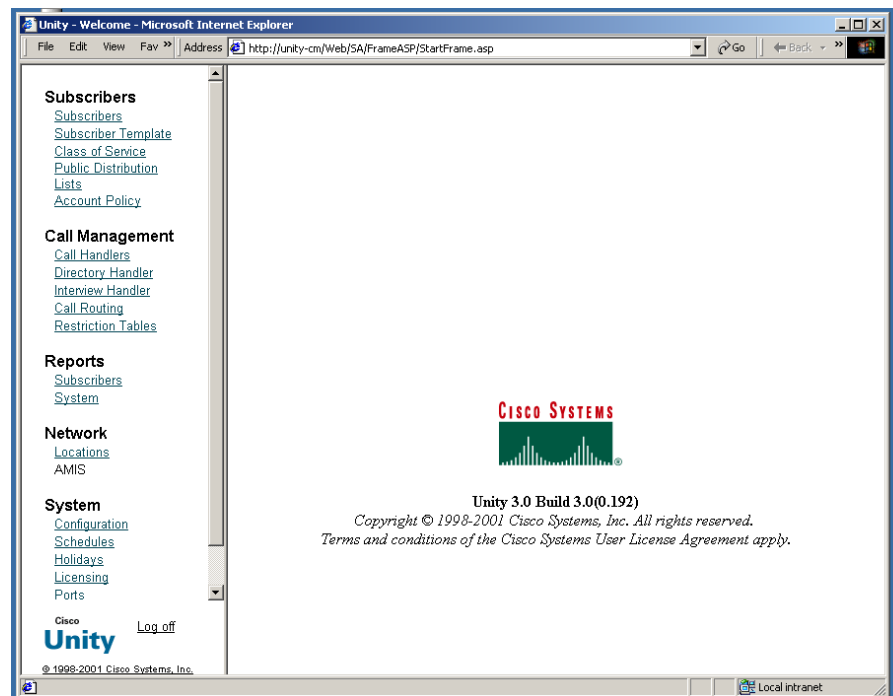
Note

After Cisco Unity software is installed on the PC, you see two icons on the desktop: System Administration and Status Monitor.

The port configuration on the Cisco Unity software must match the port configuration on the Cisco IOS Telephony Service router. To configure the Cisco Unity ports, you must perform the following steps:

- Step 1** Click the **System Administration** icon on the desktop. The screen shown in [Figure 13](#) appears.

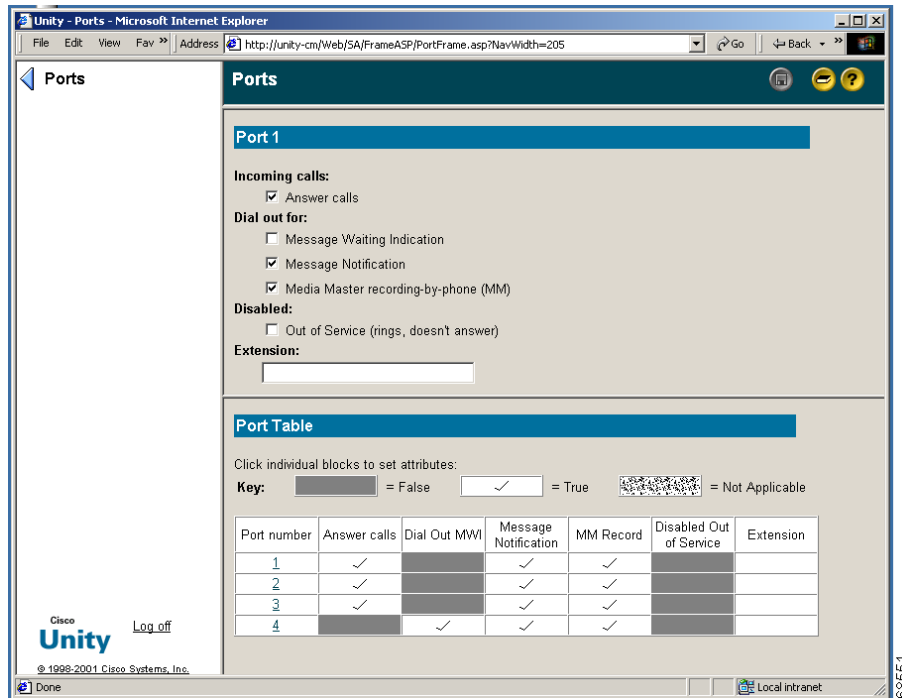
Figure 13 System Administration Window



- Step 2** In the System menu, click **Ports**. The Port Configuration dialog box, shown in [Figure 14](#), appears.
- Step 3** To match the settings from Cisco Unity, click on port number **1** and select **Answer Calls**. Make sure that **Dial Out MWI** is not selected, as shown in [Figure 14](#).
- Step 4** Click on port number **2** and repeat Step 3.
- Step 5** Click on port number **3** and repeat Step 3.

- Step 6** Click on port **4**. Make sure that the **Answer Calls** option is not selected and that the **Dial Out MWI** option is selected, as shown in [Figure 14](#).

Figure 14 Port Configuration Window

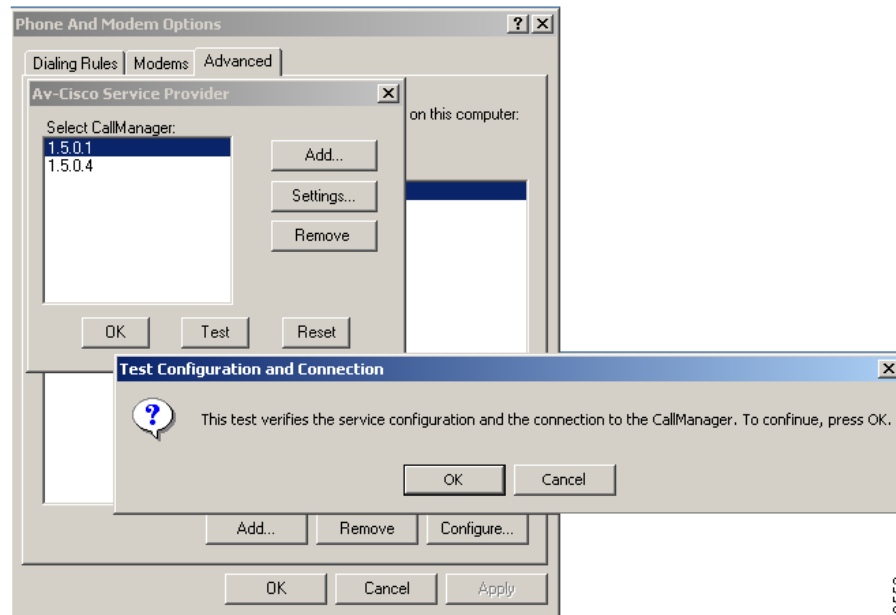


Verifying Cisco Unity Configuration

To verify Cisco Unity configuration, perform the following steps:

- Step 1** Go to **Start>Settings>Control Panel>Telephony>Telephony Drivers>Unity Service Provider for CallManager**. Select **Configure**. The Av-Cisco Service Provider window appears, as shown in [Figure 15](#).
- Step 2** Click **Test** in the Av-Cisco Service Provider window, shown in [Figure 15](#), and complete the subsequent steps as needed.

Figure 15 Av-Cisco Service Provider Window



68552

Troubleshooting Tips

On the Cisco IOS Telephony Service Router

If you are having problems with calls not getting forwarded to the Cisco Unity Voice Mail or problems with the MWI light not turning on or off, use the **debug** commands for debugging the Cisco IOS Telephony Service router to verify that the appropriate calls are set up between Cisco Unity and the router.

On the Cisco Unity TSP

For specific problems on the Cisco Unity side, refer to the Cisco Unity documentation. Go to the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/unity24/tsg/tsg246.pdf

DTMF Integration with Legacy Voice-Mail Devices (optional)

For dual tone multifrequency (DTMF) integrations, information on how to route incoming or forwarded calls is sent by the telephone system in the form of DTMF digits. The DTMF digits are in the form of a pattern and depend on the voice-mail system connected to the Cisco IOS Telephony Service router. These patterns are required for the DTMF integration with most voice-mail systems. The DTMF integration configuration on the Cisco IOS Telephony Service router works with any analog voice-mail system. Voice-mail systems are designed to respond to DTMF after the system has answered the incoming calls. The following tasks are required.

- [Configuring DTMF Patterns on the Router \(required\), page 64](#)
- [Configuring Integration Files on Legacy Voice-Mail Systems \(required\), page 65](#)

Configuring DTMF Patterns on the Router (required)

The Cisco IOS Telephony Service router provides flexibility for the integration with any legacy voice-mail system. You can configure multiple tags and tokens for each pattern, depending on the voice-mail system and type of access. The *tag* in the configuration pattern must match the number defined in the voice-mail system's integration file to identify the type of call. The keywords—**CGN**, **CDN**, and **FDN**—define the type of call information sent to the voice-mail system.

To configure DTMF pattern on the router for voice-mail integration, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# vm-integration	Enters voice-mail integration mode and enables voice-mail integration with DTMF and analog voice-mail system.
Step 2	Router(config-vm-int)# pattern direct [tag1 {CGN CDN FDN}] [tag2 {CGN CDN FDN}] [tag3 {CGN CDN FDN}] [tag4]	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when the user presses the messages button on the phone. The <i>tag</i> attribute is an alphanumeric string fewer than four DTMF digits in length. The alphanumeric string consists of a combination of four letters (A,B,C, and D), two symbols (* and #), and ten digits (0 to 9). The tag numbers match the numbers defined in the voice-mail system's integration file, immediately preceding either the number of the calling party, the number of the called party, or a forwarding number. The Cisco IOS Telephony Service router supports a maximum of four tags. The keywords— CGN , CDN , and FDN —configure the type of call information sent to the voice-mail system, such as calling number (CGN), called number (CDN), or forwarding number (FDN).
Step 3	Router(config-vm-int)# pattern ext-to-ext busy [tag1 {CGN CDN FDN}] [tag2 {CGN CDN FDN}] [tag3 {CGN CDN FDN}] [tag4]	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension attempts to connect to a busy extension and the call is forwarded to voicemail.
Step 4	Router(config-vm-int)# pattern ext-to-ext no-answer [tag1 {CGN CDN FDN}] [tag2 {CGN CDN FDN}] [tag3 {CGN CDN FDN}] [tag4]	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
Step 5	Router(config-vm-int)# pattern trunk-to-ext busy [tag1 {CGN CDN FDN}] [tag2 {CGN CDN FDN}] [tag3 {CGN CDN FDN}] [tag4]	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an external trunk call reaches a busy extension and the call is forwarded to voicemail.
Step 6	Router(config-vm-int)# pattern trunk-to-ext no-answer [tag1 {CGN CDN FDN}] [tag2 {CGN CDN FDN}] [tag3 {CGN CDN FDN}] [tag4]	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when an external trunk call reaches an unanswered extension and the call is forwarded to voicemail.

**Note**

Although it is unlikely that you will use multiple instances of the **CGN**, **CDN**, or **FDN** keyword in a single command line, it is permissible to do so.

Configuring Integration Files on Legacy Voice-Mail Systems (required)

To configure the integration files on the third-party legacy voice-mail system, follow the instructions in the accompanying voice-mail system documents. You must design the DTMF integration patterns appropriately, so that the voice-mail system and the Cisco IOS Telephony Service router work with each other.

Integrating Cisco IOS Telephony Service with Applications

The PC applications software for the Cisco IOS Telephony Service—CiscoIOSTSP, a Telephony Application Programming Interface (TAPI) service provider software package—works as an interface between the TAPI running on Microsoft Windows and the Cisco IOS Telephony Service router. This software:

- Communicates with the TAPI using the Telephony Service Provider Interface (TSPI).
- Implements a required set of application programming interfaces (APIs) and works with TAPI.
- Enables other TAPI-based applications to provide call control to the Cisco IP phones connected to the Cisco IOS Telephony Service router.

**Note**

The Cisco IOS Telephony Service Version 2.01 implements only a small subset of TAPI functionality. It supports only TAPI clients that operate on one phone line at a time. The CiscoIOSTSP support does not have full TAPI support for multiple users or for complex features. Also, this TAPI version does not have direct media and voice handling capabilities.

The CiscoIOSTSP software increases your personal productivity, because you can handle phone call management from your PC without picking up the handset or dialing the numbers on the dial pad. The following features are available:

- Answering incoming calls
- Forwarding incoming calls to voice mail
- Address book dialing (placing outbound calls from an application address and phone and address book)
- Screen pop-ups with caller-ID (caller-ID-based screen pop-ups for incoming calls; simple outgoing call placement using one-click address-book style speed-dialing from the PC application)
- Placing calls on hold

**Note**

CiscoIOSTSP software does not support media or voice. Media or voice is sent to the phone.

CiscoIOSTSP Download and Setup

On the Cisco IOS Telephony Service Router

-
- Step 1** On the router collect the following information for TSP configuration:
- Identify the Cisco IP phone that needs to be associated and controlled by a TAPI client.
 - Get the username and password for the Cisco IP phone by entering the **show ephone** command.
 - Get the IP address or name of the Cisco IOS Telephony Service router (if DNS is enabled) and the port number by entering the **show telephony-service** command.
-

On the PC



Note

Download the CiscoIOSTSP.zip file from <http://www.cisco.com/cgi-bin/tablebuild.pl/ip-iostsp> to your PC. Uncompress the Zip file and run the Setup program on the PC where you want to install the TSP, and that is running Windows 2000.

- Step 1** Make sure that there is network connectivity between your PC and the Cisco IOS Telephony Service router. To verify the network connectivity, enter the **ping ip address** command on your PC, specifying the IP address of the Cisco IOS Telephony Service router.
- Step 2** Install CiscoIOSTSP.zip by running the Setup program that was downloaded. This program installs the following DLL files in the system directory of the PC.
- CiscoIOSTSP.tsp
 - CiscoIOSTUISP.dll
 - LogTrace.dll



Note

After the DLL files are installed, a configuration dialog window, Cisco IOS Telephony Service Provider, appears before the installation is complete (shown in [Figure 16](#)).

- Step 3** Enter the information in the required fields in the dialog box, as shown in [Figure 16](#).
- a. Enter the username and password that will be used by the Cisco IP phone user.
 - b. Enter the IP address and port number of the Cisco IOS Telephony Service router.
 - c. Set the Synchronous Timeout response from the Cisco IOS Telephony Service to the desired value in seconds. (The default is 3 seconds.)
 - d. If you are using the headset, check the Using HeadSet box.

Figure 16 Cisco IOS Telephony Service Provider Configuration Dialog Box

**Note**

When the Trace box is checked, the trace function slows down the TAPI application. Use the trace feature for troubleshooting. For further information, see the [“Troubleshooting TSP”](#) section on page 69.

Step 4

Restart the PC, following the prompt.

**Note**

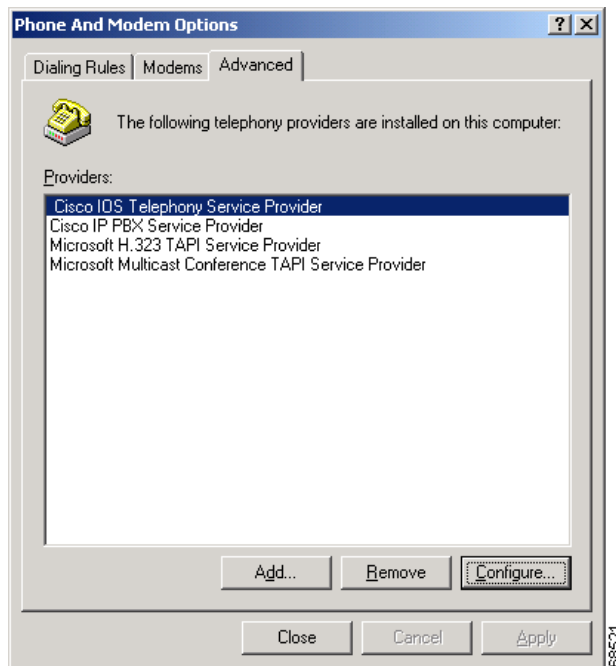
After the PC restarts, you have the option to launch third-party applications, such as ACT! or Phone Dialer software. For further information on third-party applications, see the documents provided by those vendors.

Modifying TSP Configuration

On the PC

- Step 1** To change the initial TSP configuration, select the Phone and Modem option in the control panel. The name of the option may vary, depending on the operating system.
- Step 2** Select the Advanced tab in the Phone and Modem Options dialog box, displaying Cisco IOS Telephony Service Provider in the Providers list (shown in [Figure 17](#)).

Figure 17 Phone and Modem Options Dialog Box



- Step 3** Select **Cisco IOS Telephony Service Provider** and click **Configure**, shown in [Figure 17](#).



Note The configuration dialog box, shown in [Figure 16](#), appears.

- Step 4** Enter the information in the required fields in the dialog box, shown in [Figure 16](#).
- Step 5** After changing username, password and IP address or port of the Cisco IOS Telephony Service Provider, close all the TAPI applications for the changes to take effect. If any services, such as Remote Access ConnectionManager, that depend on the Telephony service are running, restart the system for the changes to take effect. You might get a prompt to reboot your system.

Removing TSP

- Step 1** Select **Cisco IOS Telephony Service Provider** under the Control Panel and click on the **Change/Remove** button to remove the TSP software.

- Step 2** Go to the **Add Remove Programs** option under the Control Panel and remove the TSP files from your PC.
-

Verifying Basic TAPI Operation

To verify basic TAPI operations, perform the following:

- Step 1** Place an incoming call from another Cisco IP phone to the phone you are verifying.
- Step 2** Place an outgoing call from the Cisco IP phone you are verifying.
-

Troubleshooting TSP

On the Cisco IOS Telephony Service Router

- Verify the IP address and the port number for the router and make sure that they match those on the Cisco IOS Telephony Service router.
- Verify connectivity between the phone and the router.
- If the TSP fails to connect to the Cisco IOS Telephony Service router, a message box with title “Cisco IOS Telephony Service TSP status” displays the cause for failure.
- If the Line or Address are not listed in the **Preferences>Dialer** dialog box:
 - Verify that the user name and password have been configured correctly (case sensitive) and that Synchronous timeout is configured to a reasonable value (3 seconds).
 - Verify that the IP address and the port number for the Cisco IOS Telephony Service router match those on the Cisco IOS Telephony Service router.
 - Verify connectivity between the Cisco IP phone and the Cisco IOS Telephony Service router.
- Check the Trace box as shown in [Figure 18](#). The trace feature runs the trace utility logs and saves the files in a specified trace file.



Note To save the trace utility logs, name a file that you can recognize to save the trace utility logs. Each time you run the trace log, a new trace file is created. So you may need to regularly clean up the old trace files that are not required.

Figure 18 Using Trace in Cisco IOS Telephony Service Provider Configuration Dialog Box

On the PC

If the Cisco IOS Telephony Service Provider is not listed as one of the available providers in the **Control Panel>Phone and Modem Options>Add** dialog box, verify whether all the DLL files have been installed in the PC's system directory.

Monitoring and Maintaining Cisco IOS Telephony Service

To monitor and maintain the Cisco IOS Telephony Service router, enter the following commands:

Command	Purpose
Router# show run	Displays the configuration.
Router# show telephony-service all	Displays the detailed configuration of all the Cisco IP phones, voice ports, and dial peers of the Cisco IOS Telephony Service router.
Router# show telephony-service dial-peer	Displays the output of the dial peers of the Cisco IOS Telephony Service router.

Command	Purpose
Router# show telephony-service ephone-dn	Displays Cisco IP phone destination number of the Cisco IOS Telephony Service router.
Router# show telephony-service voice-port	Displays output for the voice ports of the Cisco IOS Telephony Service router.
Router# show ephone [mac-address]	Displays Cisco IP phone output.
Router# show ephone-dn tag	Displays Cisco IP phone destination number.
Router# show ephone summary	Displays a summary of all Cisco IP phones.
Router# show ephone-dn summary	Displays a summary of all Cisco IP phone destination numbers.
Router# show voice port summary	Displays a summary of all voice ports.
Router# show dial-peer voice summary	Displays a summary of all voice dial peers.

Configuration Examples

This section provides the following configuration example for the Cisco IOS Telephony Service:

```

!
version 12.2
no parser cache
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 3620
!
logging rate-limit console 10 except errors
!
!
ip dhcp pool mypool
network 30.0.0.0 255.255.0.0
option 150 ip 30.0.0.1
default-router 30.0.0.1

!
ip subnet-zero
!
!
no ip domain-lookup
!
no ip dhcp-client network-discovery
lcp max-session-starts 0
!
!
!
translation-rule 1
Rule 0 85... 919785
!
!
!
interface FastEthernet0/0
ip address 30.0.0.1 255.255.0.0
duplex auto

```

```

    speed auto
    !
interface Serial0/0
  no ip address
  shutdown
  no fair-queue
  clockrate 2000000
  !
interface Serial0/1
  no ip address
  shutdown
  clockrate 2000000
  !
ip classless
ip route 0.0.0.0 0.0.0.0 30.0.0.10
ip http server
!
!
!
tftp-server flash:SEPDEFAULT.cnf
tftp-server flash:XMLDefault.cnf.xml
tftp-server flash:P004E302.bin
tftp-server flash:P003E302.bin

snmp-server packetsize 4096
snmp-server manager
call rsvp-sync
!
voice-port 1/0/0
!
voice-port 1/0/1
!
!
mgcp profile default
!
dial-peer cor custom
  name call911
  name call1800
  name call1900
!
!
dial-peer cor list allowall
  member call911
  member call1800
  member call1900
!
dial-peer cor list allow1800
  member call1800
!
dial-peer cor list alloww1800and1900
  member call1800
  member call1900
!
!
!
telephony-service
  load 7910 P004E320
  load 7960-7940 P003E320
  url information http://30.0.0.51/GetTelecasterHelpText.ASP
  url directories http://30.0.0.4/localdirectory
  url services http://30.0.0.51/12345/i_want_url/how_long_is_this_url/test.html
  ip source-address 30.0.0.1 port 2000
  max-ephones 24
  max-dn 48

```



```
max-conferences 4
keepalive 30
dialplan-pattern 1 408735.... extension-length 4 no-reg
dialplan-pattern 2 919785.... extension-length 4 no-reg
voicemail 4001
admin-username Admin
admin-password test
dn-webedit
time-webedit
mwi sip-server 1.2.172.5
mwi expires 99999
moh minuet.au
time-format 12
date-format mm-dd-yy
transfer-pattern 1...
transfer-pattern 2...
transfer-pattern 7...
transfer-pattern 3...
interdigit timeout 5
!
!
ephone-dn 1
number 1111
name John E. Doe
call-forward busy 4001
call-forward noan 4001 timeout 10
cor incoming allowall
translate called 1
hold-alert 15 idle
!
!
ephone-dn 2
number 2222
name John A. Doe
call-forward busy 4001
call-forward noan 4001 timeout 10
cor incoming allow1800
cor incoming alloww1800and1900
cor incoming allowall 2 4000 - 4999
cor incoming allowall 2 4000 - 5000
hold-alert 30 originator
!
!
ephone-dn 3
number 3333
name john A. doe
call-forward busy 4001
call-forward noan 4001 timeout 10
cor outgoing alloww1800and1900
!
!
ephone-dn 4
number 1222
name Joe Mathew
hold-alert 45 shared
!
!
ephone-dn 5
number 2111
name Raj Haridas
!
!
ephone-dn 6
number 3111
```

```
    name Hari Haran
    !
    !
    ephone-dn 7
      number 4111
      name Mike Adler
    !
    !
    ephone-dn 8
      number 7111
      name Mike Adler
      intercom A2222 barge-in
    !
    !
    ephone-dn 9
      number 4444
      name "test test"
    !
    !
    ephone-dn 10
      number ABCD1111
      intercom ABCD2222
    !
    !
    ephone-dn 11
      number ABCD2222
      intercom ABCD1111
    !
    !
    ephone-dn 12
      number A5004
      intercom A5003
    !
    !
    ephone-dn 13
      number A5003
      intercom A5004
    !
    !
    ephone-dn 14
      number 1333
    !
    !
    ephone-dn 15
      number ABCD3333
      intercom ABCD4444
    !
    !
    ephone-dn 16
      number ABCD4444
      intercom ABCD3333
    !
    !
    ephone-dn 18
      number ABCD1133
      intercom ABCD3311 barge-in
    !
    !
    ephone-dn 19
      number ABCD3311
      intercom ABCD1133 barge-in
    !
    !
    ephone-dn 21
```

```
number 1010
name "paging"
paging
!
!
ephone-dn 22
number A5333
intercom A5444
!
!
ephone-dn 23
number A5444
intercom A5333
!
!
ephone-dn 30
number 8000
mwi on
!
!
ephone-dn 31
number 8001
mwi off
!
!
ephone-dn 32
number 4001
name "VOICEMAIL1"
no huntstop
preference 0
!
!
ephone-dn 33
number 4001
name "VOICEMAIL2"
no huntstop
preference 1
!
!
ephone-dn 40
number 2333
!
!
ephone-dn 41
number 1222
!
!
ephone-dn 48
number 3030
name "sharma anil"
paging ip 224.1.1.112 port 2001
!
!
ephone 1
mac-address 0003.6B54.BB15
button 1:1 2:4 3:14 4:10 6:18
paging-dn 21
!
!
!
ephone 2
mac-address 0003.6B09.63CF
button 1:2 2:5 3:40 4:11 5:12
paging-dn 21
```

```
!
!
!
ephone 3
  mac-address 0003.6B54.C20F
  button 1:3 2:6 3:22 4:13 5:15 6:19
  paging-dn 21
!
!
!
ephone 4
  mac-address 0003.6B40.892A
  button 1:9 3:7 5:16
  paging-dn 21
!
!
!
ephone 6
  vm-device-id CiscoUM-VI1
  button 1:32
!
!
!
ephone 7
  vm-device-id CiscoUM-VI2
  button 1:33
!
!
!
line con 0
line aux 0
line vty 0 4
  login
!
!
end
```

Command Reference

This section documents new commands. All other commands used with the Cisco IOS Telephony Service are documented in the Cisco IOS Release 12.2 command reference publications.

- **admin-password (telephony-service)**
- **admin-username (telephony-service)**
- **application (ephone-dn)**
- **button (ephone)**
- **call-forward all (ephone-dn)**
- **call-forward busy (ephone-dn)**
- **call-forward noan (ephone-dn)**
- **caller-id block (ephone-dn)**
- **cor (ephone-dn)**
- **date-format (telephony-service)**
- **debug ephone alarm**
- **debug ephone detail**
- **debug ephone error**
- **debug ephone keepalive**
- **debug ephone mwi**
- **debug ephone pak**
- **debug ephone raw**
- **debug ephone register**
- **debug ephone state**
- **debug ephone statistics**
- **debug mwi relay errors**
- **debug mwi relay events**
- **description (ephone-dn)**
- **dialplan-pattern (telephony-service)**
- **directory (telephony-service)**
- **dn-webedit (telephony-service)**
- **ephone**
- **ephone-dn**
- **hold-alert (ephone-dn)**
- **huntstop (ephone-dn)**
- **intercom (ephone-dn)**
- **ip source-address (telephony-service)**
- **keepalive (telephony-service)**
- **load (telephony-service)**

- **loopback-dn (ephone-dn)**
- **mac-address (ephone)**
- **max-conferences (telephony-service)**
- **max-dn (telephony-service)**
- **max-ephones (telephony-service)**
- **moh (telephony-service)**
- **mwi (ephone-dn)**
- **mwi relay (telephony-service)**
- **mwi expires (telephony-service)**
- **mwi sip (ephone-dn)**
- **mwi sip-server (telephony-service)**
- **name (ephone-dn)**
- **number (ephone-dn)**
- **paging (ephone-dn)**
- **paging group (ephone-dn)**
- **paging-dn (ephone)**
- **pattern direct (vm-integration)**
- **pattern ext-to-ext busy (vm-integration)**
- **pattern ext-to-ext no-answer (vm-integration)**
- **pattern trunk-to-ext busy (vm-integration)**
- **pattern trunk-to-ext no-answer (vm-integration)**
- **preference (ephone-dn)**
- **reset (ephone)**
- **reset (telephony-service)**
- **show ephone**
- **show ephone-dn**
- **show ephone-dn loopback**
- **show mwi relay clients**
- **show telephony-service admin**
- **show telephony-service admin**
- **show telephony-service all**
- **show telephony-service dial-peer**
- **show telephony-service ephone**
- **show telephony-service ephone-dn**
- **show telephony-service voice-port**
- **speed-dial (ephone)**
- **telephony-service**
- **time-format (telephony-service)**

- **timeouts interdigit (telephony-service)**
- **time-webedit (telephony-service)**
- **transfer-pattern (telephony-service)**
- **translate (ephone-dn)**
- **url (telephony-service)**
- **username (ephone)**
- **vm-device-id (ephone)**
- **vm-integration**
- **voicemail (telephony-service)**

admin-password (telephony-service)

To set a password for the local system administrator of the Cisco IOS Telephony Service router, use the **admin-password** command in telephony-service configuration mode. To disable the password for the local system administrator, use the **no** form of this command.

admin-password *password*

no admin-password *password*

Syntax Description

<i>password</i>	Password used by the administrator to prevent unauthorized access to the Cisco IOS Telephony Service router or Cisco IP phone configuration.
-----------------	--

Defaults

No default behavior or values

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series, and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **admin-password** command sets a password for the local system administrator to prevent unauthorized access to the Cisco IOS Telephony Service router or Cisco IP phone configuration. The specific password for the local system administrator is associated with the username set with the **admin-username** command. The password and the username for the local system administrator, as a pair, are associated with a specific Cisco IP phone.



Note

The password and username are used from the graphical user interface (GUI) interface for the Cisco IOS Telephony Service administration.

Examples

The following example shows how to set the password U2021 for an administrator:

```
Router(config)# telephony-service
Router(config-telephony-service)# admin-password U2021
```


Related Commands	Command	Description
	admin-username (telephony-service)	Sets the username for the local system administrator of the Cisco IOS Telephony Service router.
	telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
	username (ephone)	Assigns a phone user login account username and password to permit user login to the Cisco IOS Telephony Service router through a web browser.

admin-username (telephony-service)

To set the username for the local system administrator of the Cisco IOS Telephony Service router, use the **admin-username** command in telephony-service configuration mode. To disable the username, use the **no** form of this command.

admin-username *username*

no admin-username *username*

Syntax Description

<i>username</i>	Assigned username for the administrator; designed to prevent unauthorized access to the Cisco IOS Telephony Service router or Cisco IP phone configuration.
-----------------	---

Defaults

The default username is Admin.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **admin-username** command sets the username for the local system administrator of the Cisco IOS Telephony Service router to prevent unauthorized access to the router or Cisco IP phone configuration. The specific username of the local administrator is associated with the password set with the **admin-password** command. The username and password for the local system administrator, as a pair, are associated with a specific Cisco IP phone.



Note

The username and password are used from the graphical user interface (GUI) interface for the Cisco IOS Telephony Service administration.

Examples

The following example shows how to set the username for a local administrator:

```
Router(config)# telephony-service
Router(config-telephony-service)# admin-username sganesh
```

Related Commands

Command	Description
admin-password (telephony-service)	Sets a password for the local system administrator of the Cisco IOS Telephony Service.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
username (ephone)	Assigns a phone user login account username and password to permit user login to the Cisco IOS Telephony Service router through a web browser.

application (ephone-dn)

To select the session-level application for each Cisco IP phone directory number, use the **application** command in ephone-dn configuration mode. To disable this feature, use the **no** form of this command.

application *application-name*

no application *application-name*

Syntax Description

<i>application-name</i>	Selected interactive voice response (IVR) application name.
-------------------------	---

Defaults

No default behavior or values

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **application** command selects the session-level application for each Cisco IP phone directory number. Use this command to assign a tool command language (TCL) interactive voice response (IVR) application to the Cisco IP phone directory number (ephone-dn).

Examples

The following example shows how to set the IVR application for directory number 1:

```
Router(config)# ephone-dn 1
Router(config-ephone-dn) application TCLIVR
```

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

button (ephone)

To associate directory numbers (ephone-dn) with individual buttons on a Cisco IP phone, use the **button** command in ephone configuration mode. To delete directory numbers from the buttons on a Cisco IP phone, use the **no** form of this command.

button *button-number:dn-tag button-number:dn-tag*

no button *button-number:dn-tag button-number:dn-tag*

Syntax Description

<i>button-number</i>	Button numbers for telephone lines on a Cisco IP phone. The valid range is 1 to 6 telephone lines for the Cisco IP Phone 7960 and 1 to 2 lines for the Cisco IP Phone 7940, Cisco IP Phone 7910, and Cisco IP Conference Station 7935. Note The Cisco IP Phone 7910 has only one physical line button, but you can assign up to two lines to the phone.
<i>dn-tag</i>	Previously defined directory number tag.

Defaults

No default behavior or values

Command Modes

Ephone configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **button** command assigns telephone lines to the Cisco IP phones by assigning a button number to the Cisco IP phone directory number.

Telephone services such as call waiting and three-party conferences require a minimum of two phone lines (ephone-dn) to be available and configured on the Cisco IP phone. The Cisco IP Phone 7910 has only one physical line button. To support call waiting and three-party conferences on a Cisco IP Phone 7910, a second (hidden) line is required. This line can not be selected directly using a line button. You can access the second line when you press the conference button.

■ **button (ephone)****Examples**

The following example shows how to assign a button number on the phone to directory number tags:

```
Router(config)# ephone 1
Router(config-ephone)# button 1:1 2:4 3:16 4:19
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
show ephone	Displays Cisco IP phone output.

call-forward all (ephone-dn)

To configure call-forwarding for all the incoming calls on one of the lines of a Cisco IP phone to another telephone, use the **call-forward all** command in ephone-dn configuration mode. To disable call-forwarding, use the **no** form of this command.

call-forward all *directory-number*

no call-forward all [*directory-number*]

Syntax Description

directory-number Selected directory number. Represents a fully qualified E.164 number.

Defaults

No default behavior or values

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The call-forwarding feature is applied to the individual telephone line associated with a directory number and cannot be configured for all the directory numbers of a Cisco IP phone. The **call-forward all** command enables call forwarding for all the incoming calls on one of the lines of a Cisco IP phone to another telephone. Using the *directory number* attribute is optional, when using the **no** form of this command.



Note

The **call-forward all** command takes precedence over the **call-forward busy** and **call-forward noan** commands.

Examples

The following example shows how to set call-forwarding of all calls on line 1, directory number 5001, to directory number 5005. All incoming calls destined for extension 5001 are forwarded to another Cisco IP phone with the extension number 5005:

■ call-forward all (ephone-dn)

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# number 5001
Router(config-ephone-dn)# call-forward all 5005
```

Related Commands

Command	Description
call-forward busy	Configures call-forwarding to another number when the Cisco IP phone is busy.
call-forward noan	Configures call-forwarding to another number when no answer is received from the Cisco IP phone.
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

call-forward busy (ephone-dn)

To configure call-forwarding to another number when the Cisco IP phone is busy, use the **call-forward busy** command in ephone-dn configuration mode. To disable call-forwarding during busy, use the **no** form of this command.

call-forward busy *directory-number*

no call-forward busy [*directory-number*]

Syntax Description	<i>directory-number</i>	Selected directory number. Represents a fully qualified E.164 number.
--------------------	-------------------------	---

Defaults	No default behavior or values
----------	-------------------------------

Command Modes	Ephone-dn configuration
---------------	-------------------------

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines	The call-forwarding feature is applied to the individual telephone line associated with a directory number and cannot be configured on all directory numbers of the Cisco IP phone. The call-forward busy command enables call-forwarding to another number when the Cisco IP phone is busy. Using the <i>directory number</i> attribute is optional, when using the no form of this command.
------------------	---

Examples	The following example shows how to set call-forwarding of incoming calls to another Cisco IP phone with the directory number 5005 when line 1, directory number 5001, is busy:
----------	--

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# number 5001
Router(config-ephone-dn)# call-forward busy 5005
```

Related Commands	Command	Description
	call-forward all	Configures call-forwarding for all the incoming calls on one of the lines of a Cisco IP phone to another telephone.
	call-forward noan	Configures call-forwarding to another number when no answer is received from the Cisco IP phone.
	ephone	Enters ephone configuration mode to register Cisco IP phones.
	ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

call-forward noan (ephone-dn)

To configure call-forwarding to another number when no answer is received from a Cisco IP phone, use the **call-forward noan** command in ephone-dn configuration mode. To disable call-forwarding, use the **no** form of this command.

call-forward noan *directory-number* **timeout** *seconds*

no call-forward noan [*directory-number*]

Syntax Description		
	<i>directory-number</i>	Selected directory number. Represents a fully qualified E.164 number.
	timeout	Ringng no answer timeout duration. It is the waiting time before the call is forwarded to another phone. The time is set in seconds.
	<i>seconds</i>	Time set for the call-forwarding to start. The range is 3 to 60,000 seconds.
	Note	It is mandatory to specify and enter a timeout number in seconds, otherwise an error message "incomplete command" will appear on the console.

Defaults No default behavior or values

Command Modes Ephone-dn configuration

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The call-forwarding feature is applied to the individual telephone line associated with a directory number and cannot be configured for all the directory numbers of the Cisco IP phone. The **call-forward noan** command enables call-forwarding to another number when no answer is received from a Cisco IP phone. The **timeout** keyword sets the waiting time before the call is forwarded to another phone. The time is set in seconds. The range is 3 to 60,000 seconds. Using the *directory number* attribute is optional, when using the **no** form of this command.

Examples

The following example shows how to set call-forwarding of incoming calls to directory number 5005 when line 1, directory number 5001, does not answer. The **timeout** before the call is forwarded to the directory number 5005 is set for 10 seconds.

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# number 5001
Router(config-ephone-dn)# call-forward noan 5005 timeout 10
```

Related Commands

Command	Description
call-forward all	Configures call-forwarding for all the incoming calls on one of the lines of a Cisco IP phone to another telephone.
call-forward busy	Configures call-forwarding to another number when the Cisco IP phone is busy.
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

caller-id block (ephone-dn)

To enable caller-ID blocking for outbound calls, use the **caller-id block** command in ephone-dn configuration mode. To disable caller ID, use the **no** form of this command.

caller-id block

no caller-id block

Syntax Description

This command has no arguments or keywords.

Defaults

Caller ID is not blocked on calls originating from a Cisco IP phone.

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **caller-id block** command sets caller-ID blocking for outbound calls originated from the ephone-dn. This command requests that the far-end gateway device block display of the calling party information, for calls received by the far-end gateway from the ephone-dn. This command does not effect the ephone-dn calling party information display for inbound calls received by the ephone-dn.

Examples

The following example shows how to set caller ID blocking for the directory number 5001:

```
Router(config) ephone-dn 1
Router(config-ephone-dn)# number 5001
Router(config-ephone-dn)# caller-id block
```

Related Commands	Command	Description
	ephone	Enters ephone configuration mode to register Cisco IP phones.
	ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

cor (ephone-dn)

To configure a class of restriction (COR) on the dial peers associated with a directory number, use the **cor** command in ephone-dn configuration mode. To disable COR associated with a directory number, use the **no** form of this command.

```
cor {incoming | outgoing} cor-list-name
```

```
no cor cor-list-name
```

Syntax Description

incoming	COR list to be used by incoming dial peers.
outgoing	COR list to be used by outgoing dial peers.
<i>cor-list-name</i>	COR list name.

Defaults

No default behavior or values

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **cor** command sets the dial-peer class of restriction (COR) parameter for dial peers and the directory numbers created for the Cisco IP phones associated with the Cisco IOS Telephony Service router. The COR functionality provides the ability to deny certain call attempts based on the incoming and outgoing class of restrictions provisioned on the dial peers. This functionality provides flexibility in network design, allows users to block calls (for example, to 900 numbers), and applies different restrictions to call attempts from different originators.

COR is used to specify which incoming dial peer can use which outgoing dial peer to make a call. Each dial peer can be provisioned with an incoming and an outgoing COR list.

Examples

The following example shows how to set dial-peer COR parameter for incoming calls to dial-peer 1:

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# cor incoming corlist1
```

Related Commands	Command	Description
	corlist-incoming	Specifies the COR list to be used when a specified dial peer acts as the incoming dial peer.
	corlist-outgoing	Specifies the COR list to be used by an outgoing dial peer.
	dial-peer cor list	Defines a COR list name.
	ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

date-format (telephony-service)

To set the date display format on all the Cisco IP phones attached to the router, use the **date-format** command in telephony-service configuration mode. To disable the date display format, use the **no** form of this command.

```
date-format {mm-dd-yy | dd-mm-yy}
```

```
no date-format {mm-dd-yy | dd-mm-yy}
```

Syntax Description

mm-dd-yy	Set to month, day, and year. Each slot needs a two-digit number. This format is the default setting.
dd-mm-yy	Set to day, month, and year. Each slot needs a two-digit number.

Defaults

The default is set to **mm-dd-yy**.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **date-format** command sets the date display format on all Cisco IP phones attached to the router.

Examples

The following example sets the date format on the Cisco IP phones to date, month, and year:

```
Router(config)# telephony-service
Router(config-telephony-service)# date-format dd-mm-yy
```

Related Commands

Command	Description
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

debug ephone alarm

To set SkinnyStation alarm messages debugging for the Cisco IP phone, use the **debug ephone alarm** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone alarm [**mac-address** *mac-address*]

no debug ephone alarm [**mac-address** *mac-address*]

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone alarm** command shows all the SkinnyStation alarm messages sent by the Cisco IP phone. Under normal circumstances, this message is sent by the Cisco IP phone just before it registers, and the message has the severity level for the alarm set to “Informational” and contains the reason for the phone reboot or re-register. This type of message is entirely benign and does not indicate an error condition.

If the **mac-address** keyword is not used, the **debug ephone alarm** command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output. When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Examples

The following example shows a SkinnyStation alarm message that is sent before the Cisco IP phone registers:

```
Router# debug ephone alarm
phone keypad reset
CM-closed-TCP
```

CM-bad-state

Related Commands	Command	Description
	debug ephone detail	Sets detail debugging for the Cisco IP phone.
	debug ephone error	Sets error debugging for the Cisco IP phone.
	debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.
	debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
	debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
	debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
	debug ephone register	Sets registration debugging for the Cisco IP phone.
	debug ephone state	Sets state debugging for the Cisco IP phone.
	debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
	show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone detail

To set detail debugging for the Cisco IP phone, use the **debug ephone detail** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone detail [**mac-address** *mac-address*]

no debug ephone detail [**mac-address** *mac-address*]

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone detail** command includes the error and state levels.

If the **mac-address** keyword is not used, the **debug ephone detail** debug command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output.

When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Examples

The following example shows a sample output of detail debugging of the Cisco IP phone with MAC address 0030.94c3.8724. The sample is an excerpt of some of the activities that takes place during call setup, connected state, active call, and the call being disconnected:

```
Router# debug ephone detail mac-address 0030.94c3.8724
Ephone detail debugging is enabled
```

```
1d04h: ephone-1[1]:OFFHOOK
```

```
.
.
1d04h: Skinny Call State change for DN 1 SIEZE
.
.
1d04h: ephone-1[1]:SetCallState line 1 DN 1 TsOffHook
.
.
1d04h: ephone-1[1]:SetLineLamp 1 to ON
.
.
1d04h: ephone-1[1]:KeypadButtonMessage 5
.
.
1d04h: ephone-1[1]:KeypadButtonMessage 0
.
.
1d04h: ephone-1[1]:KeypadButtonMessage 0
.
.
1d04h: ephone-1[1]:KeypadButtonMessage 2
.
.
1d04h: ephone-1[1]:Store ReDial digit: 5002
.
SkinnyTryCall to 5002 instance 1
.
.
1d04h: ephone-1[1]:Store ReDial digit: 5002
1d04h: ephone-1[1]:
SkinnyTryCall to 5002 instance 1
.
.
1d04h: Skinny Call State change for DN 1 ALERTING
.
.
1d04h: ephone-1[1]:SetCallState line 1 DN 1 TsRingOut
.
.
1d04h: ephone-1[1]:SetLineLamp 1 to ON
1d04h: SetCallInfo calling dn 1 dn 1
calling [5001] called [5002]
.
.
1d04h: ephone-1[1]: Jane calling
1d04h: ephone-1[1]: Jill
.
.
1d04h: SkinnyUpdateDnState by EFXS_RING_GENERATE
    for DN 2 to state RINGING
.
.
1d04h: SkinnyGetCallState for DN 2 CONNECTED
.
.
1d04h: ephone-1[1]:SetLineLamp 3 to ON
1d04h: ephone-1[1]:UpdateCallState DN 1 state 4 calleddn 2
.
.
1d04h: Skinny Call State change for DN 1 CONNECTED
.
.
1d04h: ephone-1[1]:OpenReceive DN 1 codec 4:G711Ulaw64k duration 10 ms bytes 80
.
```

debug ephone detail

```

.
1d04h: ephone-1[1]:OpenReceiveChannelAck 1.2.172.21 port=20180
1d04h: ephone-1[1]:Outgoing calling DN 1 Far-ephone-2 called DN 2
1d04h: SkinnyGetCallState for DN 1 CONNECTED
.
.
1d04h: ephone-1[1]:SetCallState line 3 DN 2 TsOnHook
.
.
1d04h: ephone-1[1]:SetLineLamp 3 to OFF
.
.
1d04h: ephone-1[1]:SetCallState line 1 DN 1 TsOnHook
.
.
1d04h: ephone-1[1]:Clean Up Speakerphone state
1d04h: ephone-1[1]:SpeakerPhoneOnHook
1d04h: ephone-1[1]:Clean up activeline 1
1d04h: ephone-1[1]:StopTone sent to ephone
1d04h: ephone-1[1]:Clean Up phone offhook state
1d04h: SkinnyGetCallState for DN 1 IDLE
1d04h: called DN -1, calling DN -1 phone -1
1d04h: ephone-1[1]:SetLineLamp 1 to OFF
1d04h: UnBinding ephone-1 from DN 1
1d04h: UnBinding called DN 2 from DN 1
1d04h: ephone-1[1]:ONHOOK
1d04h: ephone-1[1]:SpeakerPhoneOnHook
1d04h: ephone-1[1]:ONHOOK NO activeline
.
.
.

```

Related Commands

Command	Description
debug ephone error	Sets error debugging for the Cisco IP phone.
debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.
debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
debug ephone register	Sets registration debugging for the Cisco IP phone.
debug ephone state	Sets state debugging for the Cisco IP phone.
debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone error

To set error debugging for the Cisco IP phone, use the **debug ephone error** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone error [**mac-address** *mac-address*]

no debug ephone error [**mac-address** *mac-address*]

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug phone error** command cancels debugging at the detail and state level.

If the **mac-address** keyword is not used, the **debug ephone error** debug command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output. When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Examples

The following example shows a sample output of error debugging for the Cisco IP phone with MAC address 0030.94c3.8724:

```
Router# debug ephone error mac-address 0030.94c3.8724
EPHONE error debugging is enabled

socket [2] send ERROR 11
Skinny Socket [2] retry failure
```

Related Commands	Command	Description
	debug ephone detail	Sets detail debugging for the Cisco IP phone.
	debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.
	debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
	debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
	debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
	debug ephone register	Sets registration debugging for the Cisco IP phone.
	debug ephone state	Sets state debugging for the Cisco IP phone.
	debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
	show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone keepalive

To set keepalive debugging for the Cisco IP phone, use the **debug ephone keepalive** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

```
debug ephone keepalive [mac-address mac-address]
```

```
no debug ephone keepalive [mac-address mac-address]
```

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone keepalive** command sets keepalive debugging.

If the **mac-address** keyword is not used, the **debug ephone keepalive** debug command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output. When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Examples

The following example shows a sample output of the keepalive status for the Cisco IP phone with MAC address 0030.94C3.E1A8:

```
Router# debug ephone keepalive mac-address 0030.94c3.E1A8
EPHONE keepalive debugging is enabled for phone 0030.94C3.E1A8

1d05h: ephone-1 Set interface FastEthernet0/0  ETHERNET
1d05h: ephone-1[1]:Keepalive socket[1] SEP003094C3E1A8
```

■ debug ephone keepalive

```

1d05h: ephone-1 Set interface FastEthernet0/0  ETHERNET
1d05h: ephone-1[1]:Keepalive socket[1] SEP003094C3E1A8
1d05h: Skinny Checking for stale sockets
1d05h: ephone-1 Set interface FastEthernet0/0  ETHERNET
1d05h: ephone-1[1]:Keepalive socket[1] SEP003094C3E1A8
1d05h: ephone-1 Set interface FastEthernet0/0  ETHERNET
1d05h: ephone-1[1]:Keepalive socket[1] SEP003094C3E1A8
1d05h: Skinny active socket list (3/96):  1 2 4

```

Related Commands

Command	Description
debug ephone detail	Sets detail debugging for the Cisco IP phone.
debug ephone error	Sets error debugging for the Cisco IP phone.
debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
debug ephone register	Sets registration debugging for the Cisco IP phone.
debug ephone state	Sets state debugging for the Cisco IP phone.
debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone mwi

To set message waiting indication (MWI) debugging for the Cisco IOS Telephony Service router, use the **debug ephone mwi** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone mwi

no debug ephone mwi

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone mwi** command sets message waiting indication debugging for the Cisco IOS Telephony Service router. Since the MWI protocol activity is not specific to any individual Cisco IP phone, setting the MAC address keyword qualifier for this command is not useful.



Note

Unlike the other related **debug ephone** commands, the **mac-address** keyword does not help debug a particular Cisco IP phone.

Examples

The following example shows a sample output of the message waiting indication status for the Cisco IOS Telephony Service router:

```
Router# debug ephone mwi
```

Related Commands

Command	Description
debug ephone detail	Sets detail debugging for the Cisco IP phone.
debug ephone error	Sets error debugging for the Cisco IP phone.
debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.

Command	Description
debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
debug ephone register	Sets registration debugging for the Cisco IP phone.
debug ephone state	Sets state debugging for the Cisco IP phone.
debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone pak

To provide voice packet level debugging and to print the contents of one voice packet in every 1024 voice packets, use the **debug ephone pak** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone pak [**mac-address** *mac-address*]

no debug ephone pak [**mac-address** *mac-address*]

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone pak** command provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.

If the **mac-address** keyword is not used, the **debug ephone pak** debug command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output. When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Examples

The following example shows a sample output of packet debugging for the Cisco IP phone with MAC address 0030.94c3.8724:

```
Router# debug ephone pak mac-address 0030.94c3.8724
EPHONE packet debugging is enabled for phone 0030.94c3.8724
```

```

01:29:14: ***ph_xmit_ephone DN 3 tx_pkts 5770 dest=10.2.1.1 orig len=32
   pakcopy=0 discards 27 ip_enctype 0 0 last discard: unsupported payload type
01:29:14: to_skinny_duration 130210 offset -30 last -40 seq 0 adj 0
01:29:14: IP:   45B8 003C 0866 0000 3F11 3F90 2800 0001 0A02 0101
01:29:14: TTL 63 TOS B8 prec 5
01:29:14: UDP:  07D0 6266 0028 0000
01:29:14: sport 2000 dport 25190 length 40 checksum 0
01:29:14: RTP:  8012 16AF 9170 6409 0E9F 0001
01:29:14: is_rtp:1 is_frfl1:0 vlen:0 delta_t:160 vofr1:0 vofr2:0
scodec:11 rtp_bits:8012 rtp_codec:18 last_bad_payload 19
01:29:14: vencap FAILED
01:29:14: PROCESS SWITCH
01:29:15: %SYS-5-CONFIG_I: Configured from console by console
01:29:34: ***SkinnyPktIp DN 3 10.2.1.1 to 40.0.0.1 pkts 4880 FAST sw
01:29:34: from_skinny_duration 150910
01:29:34: nw 3BBC2A8 addr 3BBC2A4 mac 3BBC2A4 dg 3BBC2C4 dgs 2A
01:29:34: MAC:  1841 0800
01:29:34: IP:   45B8 0046 682E 0000 3E11 E0BD 0A02 0101 2800 0001
01:29:34: TTL 62 TOS B8 prec 5
01:29:34: UDP:  6266 07D0 0032 0000
01:29:34: sport 25190 dport 2000 length 50 checksum 0
01:29:34: RTP:  8012 55FF 0057 8870 3AF4 C394
01:29:34: RTP: rtp_bits 8012 seq 55FF ts 578870 ssrc 3AF4C394
01:29:34: PAYLOAD:
01:29:34:      1409 37C9 54DE 449C 3B42 0446 3AAB 182E
01:29:34:      56BC 5184 58E5 56D3 13BE 44A7 B8C4
01:29:34:
01:29:37: ***ph_xmit_ephone DN 3 tx_pkts 6790 dest=10.2.1.1 orig len=32
   pakcopy=0 discards 31 ip_enctype 0 0 last discard: unsupported payload type
01:29:37: to_skinny_duration 153870 offset -150 last -40 seq 0 adj 0
01:29:37: IP:   45B8 003C 0875 0000 3F11 3F81 2800 0001 0A02 0101
01:29:37: TTL 63 TOS B8 prec 5
01:29:37: UDP:  07D0 6266 0028 0000
01:29:37: sport 2000 dport 25190 length 40 checksum 0
01:29:37: RTP:  8012 1AAF 9173 4769 0E9F 0001
01:29:37: is_rtp:1 is_frfl1:0 vlen:0 delta_t:160 vofr1:0 vofr2:0

```

Related Commands

Command	Description
debug ephone detail	Sets detail debugging for the Cisco IP phone.
debug ephone error	Sets error debugging for the Cisco IP phone.
debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.
debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
debug ephone register	Sets registration debugging for the Cisco IP phone.
debug ephone state	Sets state debugging for the Cisco IP phone.
debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone raw

To provide raw low-level protocol debugging display for all Skinny Client Control Protocol messages, use the **debug ephone raw** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone raw [**mac-address** *mac-address*]

no debug ephone raw [**mac-address** *mac-address*]

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone raw** command provides raw low-level protocol debug display for all Skinny Client Control Protocol messages. The debug display provides byte level display of Skinny TCP socket messages.

If the **mac-address** keyword is not used, the **debug ephone raw** debug command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output. When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Examples

The following example shows a sample output of raw protocol debugging for the Cisco IP phone with MAC address 0030.94C3.E1A8:

```
Router# debug ephone raw mac-address 0030.94c3.E1A8
```

debug ephone raw

EPHONE raw protocol debugging is enabled for phone 0030.94C3.E1A8

```

1d05h: skinny socket received 4 bytes on socket [1]
0 0 0 0
1d05h:
1d05h: SkinnyMessageID = 0
1d05h: skinny send 4 bytes
4 0 0 0 0 0 0 0 0 0 1 0 0
1d05h: socket [1] sent 12 bytes OK (incl hdr) for ephone-(1)

1d06h: skinny socket received 4 bytes on socket [1]
0 0 0 0
1d06h:
1d06h: SkinnyMessageID = 0
1d06h: skinny send 4 bytes
4 0 0 0 0 0 0 0 0 0 1 0 0
1d06h: socket [1] sent 12 bytes OK (incl hdr) for ephone-(1)

```

Related Commands

Command	Description
debug ephone detail	Sets detail debugging for the Cisco IP phone.
debug ephone error	Sets error debugging for the Cisco IP phone.
debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.
debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
debug ephone register	Sets registration debugging for the Cisco IP phone.
debug ephone state	Sets state debugging for the Cisco IP phone.
debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone register

To set registration debugging for the Cisco IP phone, use the **debug ephone register** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone register [**mac-address** *mac-address*]

no debug ephone register [**mac-address** *mac-address*]

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone register** command sets registration debugging for the Cisco IP phones.

If the **mac-address** keyword is not used, the **debug ephone register** debug command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output. When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Syntax Description

The following example shows a sample output of registration debugging for the Cisco IP phone with MAC address 0030.94c3.8724:

```
Router# debug ephone register mac-address 0030.94c3.8724
Ephone registration debugging is enabled

1d06h: New Skinny socket accepted [1] (2 active)
1d06h: sin_family 2, sin_port 50778, in_addr 10.1.0.21
```

debug ephone register

```

1d06h: skinny_add_socket 1 10.1.0.21 50778
1d06h: ephone-(1)[1] StationRegisterMessage (2/3/12) from 10.1.0.21
1d06h: ephone-(1)[1] Register StationIdentifier DeviceName SEP003094C3E1A8
1d06h: ephone-(1)[1] StationIdentifier Instance 1 deviceType 7
1d06h: ephone-1[-1]:stationIpAddr 10.1.0.21
1d06h: ephone-1[-1]:maxStreams 0
1d06h: ephone-(1) Allow any Skinny Server IP address 10.1.0.6
.
.
.
1d06h: ephone-1[1]:RegisterAck sent to ephone 1: keepalive period 30
.

```

Related Commands

Command	Description
debug ephone detail	Sets detail debugging for the Cisco IP phone.
debug ephone error	Sets error debugging for the Cisco IP phone.
debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.
debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
debug ephone state	Sets state debugging for the Cisco IP phone.
debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone state

To set state debugging for the Cisco IP phone, use the **debug ephone state** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone state [**mac-address** *mac-address*]

no debug ephone state [**mac-address** *mac-address*]

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone state** command sets state debugging for the Cisco IP phones.

If the **mac-address** keyword is not used, the **debug ephone state** debug command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output. When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Examples

The following example shows a sample output of state debugging for the Cisco IP phone with MAC address 0030.94c3.E1A8:

```
Router# debug ephone state mac-address 0030.94c3.E1A8
EPHONE state debugging is enabled for phone 0030.94C3.E1A8

1d06h: ephone-1[1]:OFFHOOK
1d06h: ephone-1[1]:SIEZE on activeline 0
```

■ debug ephone state

```

1d06h: ephone-1[1]:SetCallState line 1 DN 1 TsOffHook
1d06h: ephone-1[1]:Skinny-to-Skinny call DN 1 to DN 2 instance 1
1d06h: ephone-1[1]:SetCallState line 1 DN 1 TsRingOut
1d06h: ephone-1[1]:Call Info DN 1 line 1 ref 158 called 5002 calling 5001
1d06h: ephone-1[1]: Jane calling
1d06h: ephone-1[1]: Jill
1d06h: ephone-1[1]:SetCallState line 3 DN 2 TsRingIn
1d06h: ephone-1[1]:Call Info DN 2 line 3 ref 159 called 5002 calling 5001
1d06h: ephone-1[1]: Jane calling
1d06h: ephone-1[1]: Jill
1d06h: ephone-1[1]:SetCallState line 3 DN 2 TsCallRemoteMultiline
1d06h: ephone-1[1]:SetCallState line 1 DN 1 TsConnected
1d06h: ephone-1[1]:OpenReceive DN 1 codec 4:G711Ulaw64k duration 10 ms bytes 80
1d06h: ephone-1[1]:OpenReceiveChannelAck 1.2.172.21 port=24010
1d06h: ephone-1[1]:StartMedia 1.2.172.22 port=24612
1d06h: DN 1 codec 4:G711Ulaw64k duration 10 ms bytes 80
1d06h: ephone-1[1]:CloseReceive
1d06h: ephone-1[1]:StopMedia
1d06h: ephone-1[1]:SetCallState line 3 DN 2 TsOnHook
1d06h: ephone-1[1]:SetCallState line 1 DN 1 TsOnHook
1d06h: ephone-1[1]:SpeakerPhoneOnHook
1d06h: ephone-1[1]:ONHOOK
1d06h: ephone-1[1]:SpeakerPhoneOnHook
1d06h: SkinnyReportDnState DN 1 ONHOOK

```

Related Commands

Command	Description
debug ephone detail	Sets detail debugging for the Cisco IP phone.
debug ephone error	Sets ephone debugging for the Cisco IP phone.
debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.
debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
debug ephone register	Sets registration debugging for the Cisco IP phone.
debug ephone statistics	Sets statistics debugging for the Cisco IP phone.
show debugging	Displays information about the types of debugging that are enabled for your router.

debug ephone statistics

To set call statistics debugging for the Cisco IP phone, use the **debug ephone statistics** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug ephone statistics [**mac-address** *mac-address*]

no debug ephone statistics [**mac-address** *mac-address*]

Syntax Description

mac-address	(Optional) Defines the MAC address of the Cisco IP phone.
<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug ephone statistics** command provides a debug monitor display of the periodic messages from the Cisco IP phone to the router. These include transmit-and-receive packet counts and an estimate of drop packets. The call statistics can also be displayed for live calls using the **show ephone** command.

If the **mac-address** keyword is not used, the **debug ephone statistics** debug command debugs all Cisco IP phones that are registered to the router. You can remove debugging for the Cisco IP phones that you do not want to debug by using the **mac-address** keyword with the **no** form of this command.

You can enable or disable debugging on any number of Cisco IP phones. To see the Cisco IP phones that have debugging enabled, enter the **show ephone** command and look at the debug field in the output. When debugging is enabled for a Cisco IP phone, the debug output is displayed for the directory numbers associated with the Cisco IP phone.

Examples

The following example shows a sample output of statistics debugging for the Cisco IP phone with MAC address 0030.94C3.E1A8:

```
Router# debug ephone statistics mac-address 0030.94C3.E1A8
EPHONE statistics debugging is enabled for phone 0030.94C3.E1A8
```

debug ephone statistics

```

1d06h: Clear Call Stats for DN 1 call ref 162
1d06h: Clear Call Stats for DN 1 call ref 162
1d06h: Clear Call Stats for DN 1 call ref 162
1d06h: Clear Call Stats for DN 2 call ref 163
1d06h: ephone-1[1]:GetCallStats line 1 ref 162 DN 1: 5001
1d06h: ephone-1[1]:Call Stats for line 1 DN 1 5001 ref 162
1d06h: ephone-1[1]:TX Pkts 0 bytes 0 RX Pkts 0 bytes 0
1d06h: ephone-1[1]:Pkts lost 4504384 jitter 0 latency 0
1d06h: ephone-1[1]:Src 0.0.0.0 0 Dst 0.0.0.0 0 bytes 80 vad 0 G711Ulaw64k
1d06h: ephone-1[1]:GetCallStats line 1 ref 162 DN 1: 5001
1d06h: STATS: DN 1 Packets Sent 0
1d06h: STATS: DN 2 Packets Sent 0
1d06h: ephone-1[1]:Call Stats found DN -1 from Call Ref 162
1d06h: ephone-1[1]:Call Stats for line 0 DN -1 5001 ref 162
1d06h: ephone-1[1]:TX Pkts 275 bytes 25300 RX Pkts 275 bytes 25300
1d06h: ephone-1[1]:Pkts lost 0 jitter 0 latency 0

```

Related Commands

Command	Description
debug ephone detail	Sets detail debugging for the Cisco IP phone.
debug ephone error	Sets error debugging for the Cisco IP phone.
debug ephone keepalive	Sets keepalive debugging for the Cisco IP phone.
debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IP phone.
debug ephone pak	Provides voice packet level debugging and prints the contents of one voice packet in every 1024 voice packets.
debug ephone raw	Provides raw low-level protocol debugging display for all Skinny Client Control Protocol messages.
debug ephone register	Sets registration debugging for the Cisco IP phone.
debug ephone state	Sets state debugging for the Cisco IP phone.
show debugging	Displays information about the types of debugging that are enabled for your router.

debug mwi relay errors

To debug message waiting indication (MWI) relay errors, use the **debug mwi relay errors** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug mwi relay errors

no debug mwi relay errors

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **debug mwi relay errors** command provides a debug monitor display of any error messages, when MWI Relay Server (Cisco IOS Telephony Server) is trying to do MWI Relay to extensions on remote ITS.

Examples

The following examples show errors when MWI Relay Server tries to do a MWI Relay to extension 7004, but location of 7004 is not known to the MWI Relay Server.

```
Router# debug mwi relay errors mwi-relay error info debugging is on
Router#
01:46:48: MWI-APP: mwi_notify_status: No ClientID (7004) registered
```

Related Commands

Command	Description
debug mwi events	Sets MWI relay events debugging for the Cisco IOS Telephony Service router.
debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IOS Telephony Service router.

debug mwi relay events

To set MWI relay events debugging, use the **debug mwi relay events** command in privileged EXEC mode. To disable debugging, use the **no** form of this command.

debug mwi relay events

no debug mwi relay events

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The **debug mwi relay events** command provides a debug monitor display of events, when MWI Relay Server (IOS Telephony Server) is trying to do MWI Relay to extensions on remote ITS.

Examples The following debug messages are shown when MWI Relay server tries to send MWI Information to remote client 7001 and the location of 7001 is known by the MWI Relay Server

```
Router# debug mwi relay events
mwi-relay events info debugging is on

01:45:34: mwi_notify_status: Queued event for mwi_app_queue
01:45:34: MWI-APP: mwi_app_process_event:
01:45:34: MWI-APP: mwi_app_process_event: MWI Event for ClientID(7001)@(1.8.17.22)
```

Related Commands	Command	Description
	debug mwi errors	Sets message waiting indication (MWI) relay errors debugging for the Cisco IOS Telephony Service router.
	debug ephone mwi	Sets message waiting indication (MWI) debugging for the Cisco IOS Telephony Service router.

description (ephone-dn)

To enable a alphanumeric description label in the top black bar on the display screen for a Cisco IP Phone 7960 and Cisco IP Phone 7940, use the **description** command in ephone configuration mode. To remove the alphanumeric description label, use the **no** form of this command.

description *text-string-with-spaces*

no description *text-string-with-spaces*

Syntax Description

text-string-with-spaces

Definition of the alphanumeric description for the Cisco IP phone. A text string up to 16 characters in length, including spaces, is used.

Note Although 32 characters can fit in the top line of the phone display, we recommend using 16 characters. If more than 16 characters are used, the extra characters will erase the existing time and date display in the black bar.

Defaults

No default behavior or values

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.2(11)T	This command was introduced on the following platforms: Cisco 1751, Cisco 1760, Cisco 2600 series, Cisco 3600 series, Cisco IAD2420 series IADs, Cisco 3725 and Cisco 3745 routers.

Usage Guidelines

The **description** command enables a meaningful alphanumeric description label in the top black bar on the display screen for a Cisco IP Phone 7960 and Cisco IP Phone 7940 connected to the Cisco IOS Telephony Service router. The description consists of a text string up to 16 characters in length, including spaces, and is associated with the first (top) button of the Cisco IP phone.

Examples

The following example sets DN 5 (extension number 8001) with the description 408 555 1212 for the top line display:

```
Router(config)# ephone-dn 5
Router(config-ephone-dn)# number 8001
Router(config-ephone-dn)# description 408 555 1212
```

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
number	Configures a valid number for the Cisco IP phone.

dialplan-pattern (telephony-service)

To create a global prefix that can be used to expand the abbreviated extension numbers into fully qualified E.164 numbers, use the **dialplan-pattern** command in telephony-service configuration mode. To disable, use the **no** form of this command.

dialplan-pattern *tag pattern extension-length length* [**no-reg**]

no dialplan-pattern *tag [pattern extension-length length]*

Syntax Description

<i>tag</i>	Dial-plan string tag used before a ten-digit telephone number. The tag number is from 1 to 5.
<i>pattern</i>	Dial-plan pattern, such as the area code, the prefix, and the first one or two digits of the extension number.
extension-length	The number of extension digits.
<i>length</i>	The number of extension digits. The range is from 1 - 32.
no-reg	(Optional) Prevents the E.164 numbers in the dial-peer from registering to the gatekeeper.

Defaults

No default behavior or values

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

Directory numbers for the Cisco IP phones are expected to be entered in extension number format. The extension number should be greater or equal to the extension length. Otherwise, the extension number cannot be converted to a qualified E.164 number. The **dialplan-pattern** command creates a global prefix that can be used to expand the abbreviated extension numbers to fully qualified E.164 numbers. The

dialplan-pattern is also required to register the Cisco IP phone lines with a gatekeeper. The **dialplan-pattern** command can resolve an incoming call with a full E.164 number to a Cisco IP phone extension number.

The **extension-length** keyword enables the system to convert a full E.164 telephone number back to an extension number for the purposes of caller-ID display, received, and missed call lists. For example, a company uses extension number range 5000-5099 across several sites, with only the extensions 5000-5009 present on the local router. An incoming call from 5044 arrives from the company's internal VoIP H.323 network and this call includes the calling number as 4083335044 in its full E.164 format.

The **no-reg** keyword provides dialing flexibility. You have the option not to register some specific numbers to the gatekeeper so that those numbers can be used for other telephony services.

When the called number matches the dial-plan pattern, the call is considered a local call and has a distinctive ringing identifying the call as internal. Any call that does not match the dial-plan pattern, is considered an external call and has a distinctive ringing different from the internal ringing. The valid dial-plan pattern with the lowest tag is used as a prefix to all local Cisco IP phones.

Examples

The following example shows how to create dialplan-pattern 1 for extension numbers 5001 to 5099 with the telephone prefix starting with 408333. If the following example is set, the routers sees that the 4083335044 matches dialplan-pattern 1, and uses the **extension-length** keyword to extract the last four digits of the number 5044 and present this as the caller ID for the incoming call.

```
Router(config)# telephony-service
Router(config-telephony-service)# dialplan-pattern 1 40833350.. extension-length 4 no-reg
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

directory (telephony-service)

To define Cisco IP phone local directory naming order, use the **directory** command in telephony-service configuration mode. To disable the directory URL, use the **no** form of this command.

```
directory {first-name-first | last-name-first}
```

```
no directory {first-name-first | last-name-first}
```

Syntax Description

first-name-first	First name is entered first in the Cisco IP phone directory name field.
last-name-first	Last name is entered first in the Cisco IP phone directory name field.

Defaults

The local directory support is enabled by default.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **directory** command defines the local directory naming order and points to the directory access to any HTTP location. The actual directory of names and phone numbers is built using the **name** command and the **number** command under ephone-dn configuration mode.

When the command is set to **first-name-first** keyword, you see the directory information displayed on the phone, for example, Jane E. Smith; and when the command is set with the **last-name-first** keyword, you see the directory information displayed on the phone, for example, Smith, Jane E.

Examples

The following example shows how to configure the local directory with the first name first:

```
Router(config)# telephony-service
Router(config-telephony-service)# directory first-name-first
```

The following example shows how to configure the local directory with the last name first:

```
Router(config)# telephony-service
Router(config-telephony-service)# directory last-name-first
```

Related Commands	Command	Description
	name	Configures a username associated with a directory number.
	number	Configures a valid number for the Cisco IP phone.
	telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
	url	Provisions URLs for use by the Cisco IP phones connected to the Cisco IOS Telephony Service router.

dn-webedit (telephony-service)

To enable adding of directory numbers through a web interface, use the **dn-webedit** command in telephony-service configuration mode. To disable this feature, use the **no** form of this command.

dn-webedit

no dn-edit

Syntax Description

This command has no arguments or keywords.

Defaults

Disabled

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **dn-webedit** command enables adding of the directory through the Cisco IOS Telephony Service web-based graphical user interface (GUI). If **dn-webedit** command is enabled, the GUI administrator can modify and assign the phone numbers associated with the Cisco IOS Telephony Service router. This may not be desirable in cases where the set of numbers used by the Cisco IOS Telephony Service router are part of a larger telephone network. Disabling dn-webedit prevents the administrator from allocating phone numbers and also prevents assignment of numbers that may already be used elsewhere in the network.

Examples

The following example shows how to enable editing of directory numbers through the web-based GUI interface:

```
Router(config)# telephony-service
Router(config-telephony-service)# dn-webedit
```

Related Commands	Command	Description
	ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
	telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
	time-webedit	Enables setting time through the web interface.

ephone

To enter the Ethernet phone (ephone) configuration mode, use the **ephone** command in global configuration mode. To disable the ephone configuration mode, use the **no** form of this command.

ephone *tag*

no ephone *tag*

Syntax Description	<i>tag</i>	Number of Ethernet phone tag. The maximum number is platform dependent: <ul style="list-style-type: none"> • Cisco 1750—24 Cisco IP phones • Cisco 1751—24 Cisco IP phones • Cisco 2600 series—24 Cisco IP phones • Cisco 2600-XM series—24 Cisco IP phones • Cisco 3620—24 Cisco IP phones • Cisco IAD2420—24 Cisco IP phones • Cisco 3640—48 Cisco IP phones • Cisco 3660—48 Cisco IP phones • Cisco 3725—48 Cisco IP phones • Cisco 3745—48 Cisco IP phones
Defaults	No Cisco IP phone is configured.	
Command Modes	Global configuration	
Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

This is a top-level command used to configure Cisco IP phones on the Cisco IOS Telephony Service router. By default, no Cisco IP phone is configured. Therefore, you must manually enter the number of Cisco IP phones you need to configure in your network by entering the **max-ephones** and **max-dn** commands.

Examples

The following example shows how to enter ephone configuration mode for phone 4:

```
Router(config)# ephone 4
Router(config-ephone)#
```

Related Commands

Command	Description
button	Assigns a button number to the Cisco IP phone directory number.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
mac-address	Configures the MAC address of the Cisco IP phone
max-dn	Sets the maximum number of directory numbers that can be supported by the router.
max-ephones	Configures the maximum number of Cisco IP phones that can be supported by the router.
paging-dn	Sets audio paging directory number for each Cisco IP phone.
reset	Resets the Cisco IP phones in the ephone configuration mode.
speed-dial	Sets speed-dial buttons on a Cisco IP phone.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
username	Assigns a phone user login account username and password to permit user login to the Cisco IOS Telephony Service router through a web browser.
vm-device-id	Defines voice mail ID string.

ephone-dn

To configure the directory numbers for the Cisco IP phone lines, voice-mail ports, message waiting indication (MWI) code, and to enter ephone-dn configuration mode, use the **ephone-dn** command in global configuration mode. To disable the directory numbers for the Cisco IP phone lines, use the **no** form of this command.

ephone-dn *dn-tag*

no ephone-dn *dn-tag*

Syntax Description	<i>dn-tag</i>	Directory number tag. The maximum directory number is platform dependent:
		<ul style="list-style-type: none"> • Cisco 1750—96 directory number • Cisco 1751—96 directory numbers • Cisco 2600 series—96 directory numbers • Cisco 2600-XM series—96 directory numbers • Cisco 3620—96 directory numbers • Cisco IAD2420 series—96 directory numbers • Cisco 3640—192 directory numbers • Cisco 3660—192 directory numbers • Cisco 3725—192 directory numbers • Cisco 3745—192 directory numbers

Defaults No directory number is configured.

Command Modes Global configuration

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

This is a top-level command used to configure Cisco IP phones on the Cisco IOS Telephony Service router. By default, no directory number is configured. Therefore, you must manually enter the number of Cisco IP phones you need to configure in your network by entering the **max-ephones** and **max-dn** commands.

Examples

The following example shows how to configure the directory numbers for the Cisco IP phone lines and enters ephone-dn configuration mode:

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)#
```

Related Commands

Command	Description
application	Selects session-level application on a per Cisco IP phone directory number basis.
call-forward all	Configures call-forwarding for all the incoming calls on one of the lines of a Cisco IP phone to another telephone.
call-forward busy	Configures call-forwarding to another number when the Cisco IP phone is busy.
call-forward noan	Configures call-forwarding to another number when no answer is received from the Cisco IP phone.
caller-id block	Configures caller-ID blocking for outbound calls.
cor	Configures a class of restriction (COR) on the dial peers associated with a directory number.
description	Enables an alphanumeric description label in the top black bar on the display screen for a Cisco IP Phone 7960 and Cisco IP Phone 7940.
ephone	Enters ephone configuration mode to register Cisco IP phones.
hold-alert	Sets audible alert notification on the Cisco IP phone for alerting the user about on-hold calls.
huntstop	Sets the huntstop attribute for the dial peers associated with the Cisco IP phone lines.
intercom	Defines the directory number for the Cisco IP phone that connects with another IP phone for the intercom feature.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
max-dn	Sets the maximum number of directory numbers that can be supported by the router.
max-ephones	Configures the maximum number of Cisco IP phones that can be supported by the router.
mwi	Configures specific Cisco IP phone directory numbers to receive message waiting indication (MWI) notification from an external voice-mail system.
mwi sip	Subscribes an extension in a Cisco IOS Telephony Service router to receive message waiting indication (MWI) notification from a SIP MWI server.
name	Configures a username associated with a directory number.
number	Configures a valid number for the Cisco IP phone.

Command	Description
paging	Sets paging numbers that can be called in order to broadcast an audio page to a group of Cisco IP phones.
paging group	Sets audio paging directory number for a large combined group.
preference	Sets preference for the attached dial peer for a directory number.
translate	Selects a translation rule to numbers dialed by the Cisco IP phone users.

hold-alert (ephone-dn)

To set audible alert notification on the Cisco IP phone for alerting the user about on-hold calls, use the **hold-alert** command in ephone-dn configuration mode. To disable this feature, use the **no** form of this command.

hold-alert *timeout* { **idle** | **originator** | **shared** }

no hold-alert *timeout* { **idle** | **originator** | **shared** }

Syntax Description

<i>timeout</i>	Time interval in seconds the audible alert notification is repeated.
idle	Alert only during the idle state.
originator	Alert always: on idle or busy state.
shared	Alert all phones that share the line during the idle state.

Defaults

Audible alert for on-hold calls is disabled by default. Only a visual indication is provided.

Command Modes

Ephone-dn

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **hold-alert** command sets audible alert notification on the Cisco IP phone for alerting the user about on-hold calls. The *timeout* parameter specifies the time interval in seconds from the time the call is placed on hold to the time the on-hold audible alert is generated. The alert is repeated every *timeout* seconds.

When the **idle** keyword is enabled, a one-second burst of ringing on the phone is generated on the IP phone that placed the call into the hold state, only if the phone is in the idle state. If the phone is in active use, no on-hold alert is generated.

When the **originator** keyword is enabled, a one-second burst of ringing is generated on the phone that placed the call into the hold state if the phone is in the idle state. If the phone is in use on another call, an audible beep is generated (call-waiting beep).

**Note**

From the perspective of the originator of the call-on-hold, the **shared** and the **originator** keywords provide the same functionality.

When the **shared** keyword is enabled, a one second ring burst is generated for all the idle phones which share the same line appearance. If the phones are in use, they do not get an audio beep alert. Only the phone that initiated the call, if busy, hears a call-waiting beep.

Examples

The following example shows how to set call set audible alert notification to idle on the Cisco IP phone for alerting the user about on-hold calls:

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# number 1111
Router(config-ephone-dn)# name phone1
Router(config-ephone-dn)# hold alert 10 idle
```

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

huntstop (ephone-dn)

To set the huntstop attribute for the dial peers associated with the Cisco IP phone lines, use the **huntstop** command in ephone-dn configuration mode. To disable huntstop, use the **no** form of this command.

huntstop

no huntstop

Syntax Description This command has no arguments or keywords.

Defaults Huntstop is set by default.

Command Modes Ephone-dn configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

In the ephone-dn configuration mode, the huntstop attribute is set by default for the dial peers associated with the Cisco IP phone lines on a line-by-line basis. This allows you to prevent hunt-on-busy from redirecting a call to a busy phone into a dial-peer setup with a catch-all default destination.



Note

Use the **no huntstop** command only if you want to disable huntstop.

Examples

The following example shows how to disable huntstop for the destination dial peer with the extension 5001. The huntstop for the dial-peer is set to OFF and prevents calls to extension 5001 from being re-routed to the on-net H.323 dial-peer for 5... (The three decimal points are used as wildcards.) destination when 5001 is busy.

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# number 5001
Router(config-ephone-dn)# no huntstop
```


The following example shows a typical configuration where ephone-dn huntstop (default) is required:

```
ephone-dn 1
  number 5001

ephone 4
  button 1:1
  mac-address 0030.94c3.8724

dial-peer voice 5000 voip
  destination-pattern 5...
  session target ipv4:223.223.223.223
```

In the previous example, the huntstop attribute is set to ON by default and prevents calls to extension 5001 from being re-routed to the on-net H.323 dial-peer for 5... when the 5001 extension is busy.

The following example shows another instance in which huntstop is not desired and is explicitly disabled:

```
ephone-dn 1
  number 5001
  no huntstop
  preference 1
  call-forward noan 6000

ephone-dn 2
  number 5001
  preference 2
  call-forward busy 6000
  call-forward noan 6000

ephone 4
  button 1:1 2:2
  mac-address 0030.94c3.8724

dial-peer voice 6000 pots
  destination-pattern 6000
  huntstop
  port 1/0/0
  description answering-machine
```

In this example, ephone 4 is configured with two lines, each with the same extension number 5001. This is done in order to allow the second line to provide call waiting notification for extension number 5001 when the first line is in use. Setting no huntstop on the first line (ephone-dn 1) allows incoming calls to hunt to the second line (ephone-dn 2) on ephone 4 when the ephone-dn 1 line is busy.

The ephone-dn 2 has call-forwarding set to extension 6000, which corresponds to a locally attached answering machine connected to a Foreign Exchange Station (FXS) voice-port. In this example, the plain old telephone service (POTS) dial-peer for extension 6000 also has the dial-peer huntstop attribute explicitly set to prevent further hunting.

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
huntstop (dial-peer)	Disables all further dial-peer hunting if a call fails using hunt groups.

intercom (ephone-dn)

To define the directory number for the Cisco IP phone that connects with another Cisco IP phone for the intercom feature, use the **intercom** command in ephone-dn configuration mode. To disable this feature, use the **no** form of this command.

intercom *directory number* [**barge-in** | **no-auto-answer**] [**label** *label*]

no intercom *directory number*

Syntax Description

<i>directory number</i>	The telephone number where the intercom calls are placed.
barge-in	(Optional) Allows inbound intercom calls to force an existing call into the call-hold state and allows the intercom call to be immediately answered.
no-auto-answer	(Optional) Disables intercom auto-answer feature.
label	(Optional) Defines a text label for the intercom.
<i>label</i>	(Optional) The actual text label.

Defaults

By default, intercom functionality is disabled for the ephone-dn.

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **intercom** command dedicates a pair of ephone-dns for use as a “press to talk” two-way intercom between two IP phones. Intercom lines cannot be used in shared line configurations. If an ephone-dn is configured for intercom operation, it must be associated to one Cisco IP phone only. The intercom attribute causes an IP phone line (ephone-dn) to operate as auto-dial for outbound calls and auto-answer-with-mute for inbound calls.

The **barge-in** keyword allows inbound intercom calls to force an existing call into the call-hold state and allows the intercom call to be immediately answered. The **label** keyword defines a text label for the intercom. The **no-auto-answer** keyword creates a connection for the IP phone line resembling a private line, automatic ringdown (PLAR).

Examples

The following example shows how to set the intercom on Cisco IP phone directory number 1:

```
Router(config)# ephone-dn 1
Router(config-ephone-dn) number A5001
Router(config-ephone-dn) name "intercom"
Router(config-ephone-dn) intercom A5002 barge-in
```

The following example shows intercom configuration between two Cisco IP phones:

```
ephone-dn 18
 number A5001
 name "intercom"
 intercom A5002 [barge-in]
ephone-dn 19
 number A5002
 name "intercom"
 intercom A5001 [barge-in]
ephone 4
 button 1:2 2:4 3:18
ephone 5
 button 1:3 2:6 3:19
```

In this example, directory number (ephone-dn) 18 and directory number (ephone-dn) 19 are set as an intercom pair. Directory number (DN) 18 is associated with button 3 of Cisco IP phone (ephone) 4 and directory number (DN) 19 is associated with button number 3 of Cisco IP phone (ephone) 5. Button 3 on both Cisco IP phone 4 and Cisco IP phone 5 are set as a pair to provide intercom service to each other.

The intercom feature acts as a combination speed-dial PLAR and auto-answer with mute. If the barge-in attribute is set on the DN receiving the intercom call, the existing call is forced into the hold state, and the intercom call is accepted. If the phone user has the handset off hook (that is, not in speakerphone mode), the user hears a warning beep, and the intercom call is immediately connected with two-way audio. If the phone user is using speakerphone mode, the intercom connects with the microphone mute activated.

**Note**

Dialing in to an intercom by any caller and auto-dial to a nonintercom destination are not prohibited. Calls to an intercom dn originated by a nonintercom caller triggers auto-answer. To prevent nonintercom originators from manually dialing to an intercom destination, use of the special A, B, C, or D dual-tone multifrequency (DTMF) digits in the intercom phone numbers is recommended because these digits cannot be dialed from a normal phone.

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.

ip source-address (telephony-service)

To enable the router to receive messages from the Cisco IP phones through the specified IP addresses and ports, use the **ip source-address** command in telephony-service configuration mode. To disable the router from receiving messages from Cisco IP phones, use the **no** form of this command.

ip source-address *ip-address* [**port** *port*] [**any-match** | **strict-match**]

no ip source-address *ip-address* [**port** *port*] [**any-match** | **strict-match**]

Syntax Description

<i>ip-address</i>	The preexisting router IP address, typically one of the addresses of the Ethernet port of the router.
port	(Optional) TCP/IP port used for Skinny Protocol.
<i>port</i>	(Optional) The port number.
any-match	(Optional) Disables strict IP address checking for registration.
strict-match	(Optional) Requires strict IP address checking for registration.

Defaults

The default port is 2000.

The default for the server address match is **any-match**.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **ip source-address** command is a mandatory command. The Cisco IOS Telephony Service router does not start if the IP address and the port information are not provided. If the port number is not provided, then the default is port 2000. The IP address is usually the IP address of the Ethernet port to which the phones are connected.

Use the **any-match** keyword to instruct the router to permit Cisco IP phone registration, and use the **strict-match** keyword to instruct the router to reject IP phone registration attempts if the IP server address used by the phone does not exactly match the source-address.

The **ip source-address** command enables the router to receive messages from the Cisco IP phones through the specified IP address and port.

The **ip source-address** command helps the router to autogenerate the SEPDEFAULT.cnf file and the XMLDefault.cnf.xml file, which are stored in the router's Flash memory. The SEPDEFAULT.cnf file contains the IP address of one of the Ethernet ports of the router to which the phone should register; the XMLDefault.cnf.xml file contains the IP address of one of the Ethernet ports of the router to which the ATA adapter should register.

**Note**

The SEPDEFAULT.cnf file and the XMLDefault.cnf.xml file are specific to the router and cannot be shared by multiple routers.

At some point, you must use the following commands to enable access to the SEPDEFAULT.cnf file and XMLDefault.cnf.xml file:

```
Router# tftp-server flash:SEPDEFAULT.cnf
Router# tftp-server flash:XMLDefault.cnf.xml
```

The Flash file system on some routers limits the number of times the Flash file can be written to or modified. After this limit is exceeded, the Flash memory must be manually erased and the files contained in the Flash file must be reloaded.

The **ip source-address** command can write or modify the SEPDEFAULT.cnf file or the XMLDefault.cnf.xml file only when parameters are actually changed. The file is not deleted by executing the **no ip source-address** command. However, the SEPDEFAULT.cnf file or the XMLDefault.cnf.xml file can be manually removed using the **delete** command.

If the **ip source-address** command is executed with changed parameters after the Flash file write limit is exceeded, the command fails. To see the detailed operation of the **ip source-address** command, turn on the **debug ephone detail** command.

Examples

The following example shows how to set the IP source address and port:

```
Router(config)# telephony-service
Router(config-telephony-service)# ip source-address 1.6.21.4 port 2000 strict-match
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
max-dn	Sets the maximum number of directory numbers that can be supported by the router.
max-ephones	Configures the maximum number of Cisco IP phones that can be supported by the router.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
tftp-server	Enables TFTP access to firmware files on the TFTP server so that the Cisco IP phone can get the file.

keepalive (telephony-service)

To configure the time interval between sending keepalive messages to the router used by the Cisco IP phones, use the **keepalive** command in telephony-service configuration mode. To return to the default, use the **no** form of this command.

keepalive *seconds*

no keepalive *seconds*

Syntax Description	<i>seconds</i>	The interval time in seconds. The range is 10 to 65,535 seconds. The default timeout is set at 30 seconds.
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Defaults	The default is 30 seconds.
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Command Modes	Telephony-service configuration
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Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines	The keepalive command configures the time interval between sending keepalive messages to the router used by the Cisco IP phone. The default is 30 seconds. If the router fails to receive three successive keepalive messages, it considers the phone to be out of service until the phone re-registers.
-------------------------	---

Examples	The following example shows how to set keepalive timeout at 40 seconds:
-----------------	---

```
Router(config)# telephony-service
Router(config-telephony-service)# keepalive 40
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

load (telephony-service)

To download a new phone firmware on the Cisco IP phones, use the **load** command in telephony-service configuration mode. To disable a new phone firmware on the Cisco IP phones, use the **no** form of this command.

```
load {7960-7940 | 7910 | 7935} phone-load
```

```
no load {7960-7940 | 7910 | 7935} phone-load
```

Syntax Description	7960-7940	Selects the IP phone firmware for Cisco IP Phone 7960 and Cisco IP phone 7940.
	7910	Selects the IP phone firmware for Cisco IP phone 7910.
	7935	Selects the IP phone firmware for Cisco IP Conference Station 7935.
	phone-load	Selected Cisco IP phone firmware.

Defaults No default behavior or values

Command Modes Telephony-service configuration

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines Use the **load** command to download a new phone firmware on the Cisco IP phones. You must enter this command for each type of phone. The Cisco IP Phone 7960 and Cisco IP Phone 7940 have the same phone firmware. The phone firmware should be downloaded on the HTTP server of the router.



Note

When you enter the **load** command, you do not use the extension of the file, for example, .bin.

Examples

The following example shows how to download the correct phone firmware for the specific Cisco IP phones:

**Note**

The file names are case-sensitive.

```
Router(config)# telephony-service
Router(config-telephony-service)# load 7960-7940 P003E302
Router(config-telephony-service)# load 7910 P004E302
```

```
Router(config)# tftp-server flash:P003E302.bin
Router(config)# tftp-server flash:P004E302.bin
```

**Note**

The .bin suffix is not required by the **load** command; however, the .bin suffix is required by the **tftp-server** command.

The Cisco IP phone is updated with a different phone firmware only when the Cisco IP phone reboots.

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
tftp-server	Enables TFTP access to firmware files on the TFTP server so that the Cisco IP phone can get the file.

loopback-dn (ephone-dn)

To create a virtual loopback voice port (loopback-dn) to establish a demarcation point for VoIP calls and supplementary services, use the **loopback-dn** command in ephone-dn configuration mode. To delete a loopback-dn configuration, use the **no** form of this command.

loopback-dn *dn-tag* [**forward** *number-of-digits*] [**prefix** *prefix-digit-string*] [**suffix** *suffix-digit-string*] [**retry** *seconds*] [**auto-con**]

no loopback-dn

Syntax Description		
	<i>dn-tag</i>	Unique sequence number that identifies the ephone-dn that is being paired for loopback with the ephone-dn that is currently being configured. The paired ephone-dn must be one that is already defined in the system.
	forward <i>number-of-digits</i>	(Optional) Number of digits in the original called number to forward to the other ephone-dn in the loopback-dn pair. Range is from 1 to 32 digits. Default is to forward all digits.
	prefix <i>prefix-digit-string</i>	(Optional) Defines a string of digits to add in front of the forwarded called number. Maximum number of digits in the string is 32. Default is that no prefix is defined.
	suffix <i>suffix-digit-string</i>	(Optional) Defines a string of digits to add to the end of the forwarded called number. Maximum number of digits in the string is 32. Default is that no suffix is defined. If you add a suffix that starts with the pound character (#), the string must be enclosed in quotation marks.
	retry <i>seconds</i>	(Optional) Number of seconds to wait before retrying the loopback target when it is busy or unavailable. Range is from 0 to 32767. Default is that retry is disabled and appropriate call-progress tones are passed to the call originator.
	auto-con	(Optional) Immediately connects the call and provides in-band alerting while waiting for the far-end destination to answer. Default is that automatic connection is disabled.

Defaults

All calls are set to forward all digits and not to strip any digits.
Prefix is not defined.
Suffix is not defined.
Retry is disabled.
Automatic connection is disabled.

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series, Cisco 3600 series, and Cisco IAD2420 series.
12.2(2)XT3	The suffix keyword was added.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers. The auto-con keyword was added.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers. The suffix keyword was added.

Usage Guidelines

The **loopback-dn** command is used to configure two ephone-dn virtual voice ports as back-to-back-connected voice-port pairs. A call presented on one side of the loopback-dn pair is reoriginated as a new call on the opposite side of the loopback-dn pair. The **forward**, **prefix**, and **suffix** keywords can be used to manipulate the original called number that is presented to the incoming side of the loopback-dn pair to generate a modified called number to use when reoriginating the call at the opposite side of the loopback-dn pair. For loopback-dn configurations, you must always configure ephone-dn virtual voice ports as cross-coupled pairs.

**Note**

Use of loopback-dn configurations within a VoIP network should be restricted to resolving critical network interoperability service problems that cannot otherwise be solved. Loopback-dn configurations are intended to be used in VoIP network interworking situations in which the only other alternative would be to make use of back-to-back-connected physical voice ports. Loopback-dn configurations emulate the effect of a back-to-back physical voice-port arrangement without the expense of the physical voice-port hardware. A disadvantage of loopback-dn configurations is that, because digital signal processors (DSPs) are not involved in a loopback-dn arrangement, the configuration does not support interworking or transcoding between calls that use different voice codecs. In many cases, the use of back-to-back physical voice ports that do use DSPs to resolve VoIP network interworking issues is preferred, because it introduces fewer restrictions in terms of supported codecs and call flows. Also, loopback-dns do not support T.38 fax relay.

**Note**

Cisco recommends that you create the basic ephone-dn configuration for both ephone-dn entries before configuring the loopback-dn option under each ephone-dn. The loopback-dn mechanism should be used only in situations where the voice call parameters for the calls on either side of the loopback-dn use compatible configurations; for example, compatible voice codec and DTMF relay parameters. Loopback-dn configurations should only be used for G.711 voice calls.

The loopback-dn arrangement allows an incoming telephone call to be terminated on one side of the loopback-dn port pair and a new pass-through outgoing call to be originated on the other side of the loopback-dn port pair. The loopback-dn port pair normally works with direct cross-coupling of their call states; the alerting call state on the outbound call segment is associated with the ringing state on the inbound call segment.

The loopback-dn mechanism allows for call operations (such as call transfer and call forward) that are invoked for the call segment on one side of the loopback-dn port pair to be isolated from the call segment that is present on the opposite side of the loopback-dn port pair. This approach is useful when the endpoint devices associated with the two different sides have mismatched call transfer and call forwarding capabilities. The loopback-dn arrangement allows for call transfer and call forward requests to be serviced on one side of the loopback-dn port pair by creating hairpin-routed calls when necessary. The loopback-dn arrangement avoids the propagation of call transfer and call forward requests to endpoint devices that do not support these functions.

The **loopback-dn** command provides options for controlling the called-number digits that are passed through from the incoming side to the outgoing side. The available digits can be manipulated with the **forward**, **prefix**, and **suffix** keywords.

The **forward** keyword defines the number of digits in the original called number to forward to the other ephone-dn in the loopback-dn pair. The default is set to forward all digits. The **forward** keyword can be used with any combination of the **prefix** and **suffix** keywords.

The **prefix** keyword defines a string of digits to add in front of the forwarded number.

The **suffix** keyword is most commonly used to add a terminating “#” (pound-sign) character to the end of the forwarded number to indicate that no more digits should be expected. The pound-sign character indicates to the call-routing mechanism that is processing the forwarded number that the forwarded number is complete. Providing an explicit end-of-number character also avoids a situation in which the call-processing mechanism waits for the interdigit timeout period to expire before routing the call onward using the forwarded number.

**Note**

The Cisco IOS command-line interface (CLI) requires that arguments with character strings that start with the pound-sign (#) character be enclosed within quotation marks; for example, “#”.

The **retry** keyword is used to suppress a far-end busy indication on the outbound call segment. Instead of returning a busy signal to the call originator (on the incoming call segment), a loopback-dn presents alerting or ringing tone to the caller and then periodically retries the call to the final far-end destination (on the outgoing call segment). This is not bidirectional. To prevent calls from being routed into the idle outgoing side of the loopback-dn port pair during the idle interval that occurs between successive outgoing call attempts, configure the outgoing side of the loopback-dn without a number so that there is no number to match for the inbound call.

The **auto-con** keyword is used to configure a premature trigger for a connected state for an incoming call segment while the outgoing call segment is still in the alerting state. This setup forces the voice path to open for the incoming call segment and support the generation of in-band call progress tones for busy, alerting, or ringback. The disadvantage of the **auto-con** keyword is premature opening of the voice path during the alerting stage and also triggering of the beginning of billing for the call before the call has been answered by the far end. These disadvantages should be considered carefully before you use the **auto-con** keyword.

Examples

The following example creates a loopback-dn configured with the **forward** and **prefix** keywords:

```
Router(config)# ephone-dn 7
Router(config-ephone-dn)# loopback-dn 15 forward 5 prefix 41
```

The following example creates a loopback-dn that appends the pound-sign (#) character to forwarded numbers to indicate the end of the numbers:

```
Router(config)# ephone-dn 7
Router(config-ephone-dn)# loopback-dn 16 suffix "#"
```

The following example shows a loopback-dn configuration that pairs ephone-dns 15 and 16. An incoming call (for example, from VoIP) to 4085550101 matches ephone-dn 16. The call is then reoriginated from ephone-dn 15 and sent to extension 50101. Another incoming call (for example, from a local IP phone) to extension 50151 matches ephone-dn 15. It is reoriginated from ephone-dn 16 and sent to 4085550151.

```
ephone-dn 15
 number 5015.
 loopback-dn 16 forward 5 prefix 40855
 caller-id block
 no huntstop
!
!
ephone-dn 16
 number 408555010.
 loopback-dn 15 forward 5
 caller-id block
 no huntstop
!
```

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode.
show ephone-dn	Displays information about loopback ephone-dns that have been created in a Cisco CallManager Express (Cisco CME) system.
loopback	

mac-address (ephone)

To configure the MAC address of the Cisco IP phone, use the **mac-address** command in ephone configuration mode. To disable the MAC address of the Cisco IP phone, use the **no** form of this command.

mac-address *mac-address*

no mac-address *mac-address*

Syntax Description	<i>mac-address</i>	Identifies a specific Cisco IP phone. The MAC address is typically found on a sticker located on the bottom of the Cisco IP phone.
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Defaults	No default behavior or values
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Command Modes	Ephone configuration
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Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines	The mac-address command configures the MAC address of a specific Cisco IP phone to uniquely identify the Cisco IP phone. The MAC address is printed on a sticker and placed under each Cisco IP phone.
-------------------------	---

Examples	The following example shows how to configure the actual MAC address CCFBA.321B.96FA for a Cisco IP phone:
-----------------	---

```
Router(config-ephone)# mac-address CFBA.321B.96FA
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
show ephone	Displays Cisco IP phone output.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

max-conferences (telephony-service)

To set the maximum number of simultaneous three-party conferences supported by the router, use the **max-conferences** command in telephony-service configuration mode. To return to the default conferencing numbers, use the **no** form of this command.

max-conferences *max-conference numbers*

no max-conferences *max-conference numbers*

Syntax Description

max-conference numbers The maximum number of simultaneous three-party conferences supported by the router. The maximum number of three-party conferences is platform dependent:

- Cisco 1750—8
- Cisco 1751—8
- Cisco 2600 series—8
- Cisco 2600-XM series—8
- Cisco 3620—8
- Cisco IAD2420 series—8
- Cisco 3640—8
- Cisco 3660—16
- Cisco 3725—16
- Cisco 3745—16

Defaults

The default is half of the maximum simultaneous three-party conferences numbers per platform.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **max-conferences** command supports three-party conferences for local and on-net calls only when all conference participants are using G.711. Conversion between G.711 u-law and a-law is supported. Mixing of the media streams is supported by the Cisco IOS processor. The maximum number of simultaneous conferences is limited to the platform-specific maximum.

Examples

The following example shows how to set the maximum number of conferences for a Cisco IP phone to 4:

```
Router(config)# telephony-service
Router(config-telephony-service)# max-conferences 4
```

Related Commands

Command	Description
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

max-dn (telephony-service)

To set the maximum number of directory numbers that can be supported by the router, use the **max-dn** command in telephony-service configuration mode. To return to the default directory numbers, use the **no** form of this command.

max-dn *max directory numbers*

no max-dn

Syntax Description

max directory numbers Maximum number of extensions (ephone-dns) supported by the router. The maximum number is version- and platform-dependent; for a range of values, refer to Cisco IOS command-line interface (CLI) help. Default is 0.

Defaults

The default is 0.

Syntax Description

Telephony-service configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **max-dn** command limits the number of extensions (ephone-dns) available in a Cisco CME system. The maximum number of extensions is platform- and version-dependent. Use CLI help to determine the maximum number of extensions you can set, as shown in this example:

```
Router(config-telephony-service)# max-dn ?
<1-192> Maximum directory numbers supported
```



Note

You can increase the directory numbers; but after the maximum allowable number is configured, you cannot reduce the limit of the directory numbers without rebooting the router.

Examples

The following example shows how to set the maximum number of directory numbers to 12:

```
Router(config)# telephony-service
Router(config-telephony-service)# max-dn 12
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
max-ephones	Configures the maximum number of Cisco IP phones that can be supported by the router.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

max-ephones (telephony-service)

To configure the maximum number of Cisco IP phones that can be supported by the router, use the **max-ephones** command in telephony-service configuration mode. To return to the default number of Cisco IP phones, use the **no** form of this command.

max-ephones *max phones*

no max-ephones

Syntax Description

<i>max phones</i>	Maximum number of phones supported by the Cisco CME router. The maximum number is version- and platform-dependent; for the range of values, refer to Cisco IOS command-line interface (CLI) help. Default is 0.
-------------------	---

Defaults

The default is 0.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **max-ephones** command limits the number of Cisco IP phones supported on the router. The maximum number you can set is platform- and version-dependent. Use CLI help to determine the maximum number of ephones you can set, as shown in this example:

```
Router(config-telephony-service)# max-ephones ?
<1-48> Maximum phones to support
```



Note

You can increase the number of phones; but after the maximum allowable number is configured, you cannot reduce the limit of the Cisco IP phones without rebooting the router.

Examples

The following example shows how to set the maximum number of Cisco IP phones to 24 for a Cisco router:

```
Router(config)# telephony-service
Router(config-telephony-service)# max-ephones 24
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
max-dn	Sets the maximum number of directory numbers that can be supported by the router.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

moh (telephony-service)

To configure Music On Hold (MOH), use the **moh** command in telephony-service configuration mode. To disable music on hold, use the **no** form of this command.

moh *filename*

no moh *filename*

Syntax Description	<i>filename</i>	The music file name.
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Defaults	No default behavior or values
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Command Modes	Telephony-service configuration
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Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines	The moh command configures .au and .wav format music files. Music on hold only works for G.711 calls and on-net VoIP and PSTN calls. For all other calls, tone on hold works where the user hears a periodic beep. The internal calls between Cisco IP phones do not get music on hold, instead the IP phones get tone on hold. The MOH files are downloaded to the router's Flash memory.
-------------------------	---



Note

The music on hold file can be in .wav or .au file format; however, the file format must contain 8-bit 8KHz data, for example, CCITT a-law or u-law data format.

Examples	The following example sets the music on hold with the music files:
-----------------	--

```
Router(config)# telephony-service
Router(config-telephony-service)# moh minuet.wav
Router(config-telephony-service)# moh minuet.au
```

Related Commands

Command	Description
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

mwi (ephone-dn)

To configure specific Cisco IP phone directory numbers to receive message waiting indication (MWI) notification from an external voice-mail system, use the **mwi** command in ephone-dn configuration mode. To disable this feature, use the **no** form of this command.

mwi { **off** | **on** | **on-off** }

no mwi { **off** | **on** | **on-off** }

Syntax Description	off	on	on-off
	Sets Cisco IP phone directory number to process MWI notification to OFF setting using either the main or secondary phone number.	Sets Cisco IP phone directory number to process MWI notification to ON setting using either the main or secondary phone number.	Sets Cisco IP phone directory number to process MWI notification to both ON and OFF setting using the main or secondary phone number.

Defaults No default behavior or values

Command Modes Ephone-dn configuration

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The **mwi** command configures specific Cisco IP phone directory numbers to receive message waiting indication (MWI) notification from an external voice-mail system. The notification is set for all the Cisco IP phones connected to the Cisco IOS Telephony Service router. The external voice-mail systems are often able to communicate MWI status by making telephone calls to dummy extension numbers, where the MWI information is embedded in either the called or calling party IP phone number. This command cannot be configured unless the **number** command is configured under ephone-dn configuration mode.

Examples The following example shows how to set message waiting indication to ON:


```
Router(config)# ephone-dn 1
Router(config-ephone-dn) number 8000
Router(config-ephone-dn) mwi on
```

The following example shows how to set message waiting indication to OFF.

```
Router(config)# ephone-dn 2
Router(config-ephone-dn) number 8001
Router(config-ephone-dn) mwi off
```

The following example shows how to set message waiting indication to ON-OFF for the primary and secondary number, where the MWI information is embedded in the calling party number:

```
Router(config)# ephone-dn 3
Router(config-ephone-dn) number 8002 secondary 8003
Router(config-ephone-dn) mwi on-off
```

In the example above, a call placed by the voice-mail system to 8002 turns on the MWI light for the extension number indicated by the calling party number for the MWI call. A call placed to 8003 turns the MWI light off.

The following example shows how to set message waiting indication to ON-OFF for the primary and secondary number, where the MWI information is embedded in the called party number:

```
Router(config)# ephone-dn 20
Router(config-ephone-dn) number 8000*....*1 secondary 8000*....*2
Router(config-ephone-dn) mwi on-off
```

In the example above, a call placed by the voice-mail system to 8000*5001*1 turns the MWI light for extension 5001 on. A call to 8000*5001*2 turns the MWI light off.

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
mwi expires	Sets the expire timer for registration for either the client or server.
mwi sip (ephone-dn)	Subscribes an extension in a Cisco IOS Telephony Service router to receive message waiting indication (MWI) notification from a SIP MWI server.
mwi sip-server (telephony-service)	Configures IP address and port for the external SIP-based message waiting indication (MWI) server.

mwi relay (telephony-service)

To enable the Cisco IOS Telephony Service router to relay message waiting indication (MWI) information to remote Cisco IP phones, use the **mwi relay** command in telephony-service configuration mode. To disable MWI relay, use the **no** form of this command.

mwi relay

no mwi relay

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Telephony-service configuration

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The **mwi relay** command enables the Cisco IOS Telephony Service router to relay MWI information to remote Cisco IP phones. The Cisco IOS Telephony Service router at the central site acts as a notifier after the **mwi relay** command is configured.

Examples The following example shows how to set MWI relay:

```
Router(config)# telephony-service
Router(config-telephony-service)# mwi relay
```

Related Commands	Command	Description
	mwi expires	Sets the expire timer for registration for either the client or server.

Command	Description
show mwi relay clients	Displays the list of message waiting indication (MWI) relay clients' registration information.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

mwi expires (telephony-service)

To set the expire timer for registration for either the client or server, use the **mwi expires** command in telephony-service configuration mode. To disable the expire timer for a subscription, use the **no** form of this command.

mwi expires *seconds*

no mwi expires *seconds*

Syntax Description	<i>seconds</i>	Expire time set in seconds. The default is set to 86,400 seconds (24 hours).
---------------------------	----------------	--

Defaults	Default is set to 86,400 seconds (24 hours).
-----------------	--

Command Modes	Telephony-service configuration
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Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines	The mwi expires command sets the expire timer for registration for either the client or server.
-------------------------	--

Examples	The following example shows how to set the MWI expires time to 10 seconds:
-----------------	--

```
Router(config)# telephony-service
Router(config-telephony-service)# mwi expires 10
```

Related Commands	Command	Description
	mwi relay (telephony-service)	Enables the Cisco IOS Telephony Service router to relay message waiting indication (MWI) information to remote Cisco IP phones.
	mwi sip-server (telephony-service)	Configures IP address and port for the external SIP-based message waiting indication (MWI) server.
	telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

mwi sip (ephone-dn)

To subscribe an extension in a Cisco IOS Telephony Service router to receive message waiting indication (MWI) notification from a Session Initiation Protocol (SIP) protocol-based MWI server, use the **mwi sip** command in ephone-dn configuration mode. To delete the configuration, use the **no** form of this command.

mwi sip

no mwi sip

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Ephone-dn configuration

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The **mwi sip** command subscribes an extension in a Cisco IOS Telephony Service router to receive message waiting indication (MWI) notification from a SIP MWI server. This integrates a Cisco IOS Telephony Service router with a SIP-protocol-based MWI service.

Examples The following example shows how to subscribe MWI notification from an external SIP MWI server requests the SIP MWI server to send MWI notification messages to the Cisco IOS Telephony Service router for the extension number:

```
Router(config) ephone-dn 1
Router(config-ephone-dn) number 5001
Router(config-ephone-dn) name John Smith
Router(config-ephone-dn) mwi sip

Router(config) telephony-service
Router(config-telephony-service) mwi sip-server 223.223.0.5
```

This command requests that the SIP server configured for the Cisco IOS Telephony Service router send MWI notification messages through the SIP protocol for extension 5001.

Related Commands	Command	Description
	ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
	mwi (ephone-dn)	Configures specific Cisco IP phone directory numbers to receive message waiting indication (MWI) notification from an external voice-mail system.
	mwi sip-server (telephony-service)	Configures IP address and port for the external SIP-based message waiting indication (MWI) server.
	show mwi relay clients	Displays the list of message waiting indication (MWI) relay clients' registration information.

mwi sip-server (telephony-service)

To configure IP address and port for the external Session Initiation Protocol (SIP)-based message waiting indication (MWI) server, use the **mwi sip-server** command in telephony-service configuration mode. To disable the MWI server, use the **no** form of this command.

```
mwi sip-server ip-address [[transport tcp | transport udp] | [port port number] | [reg-e164]]
```

```
no mwi sip-server ip-address
```

Syntax Description

<i>ip-address</i>	The IP address and port of the MWI server.
transport tcp	(Optional) Transport layer protocol is TCP. The default is TCP.
transport udp	(Optional) Transport layer protocol is User Datagram Protocol (UDP).
port	(Optional) Default SIP port.
<i>port number</i>	(Optional) The SIP port number. The default SIP port number is 5060.
reg-e164	(Optional) Regular E.164 ten-digit number.

Defaults

Default transport layer protocol is TCP.

Default port number is 5060 (SIP standard port).

Default registration is with an extension number.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **mwi sip-server** command configures the IP address of an external SIP MWI server. This IP address is used in conjunction with the **mwi sip (ephone-dn)** command to subscribe individual ephone-dn extension numbers to the MWI SIP server's notification list. SIP MWI client runs TCP as default.

The **transport tcp** keyword is the default setting. The **transport udp** keyword allows you to integrate with SIP MWI client. The optional **port** keyword is used to specify a port number. The default SIP port number is 5060. The default registration is with an extension number, so the **reg-e164** keyword allows you to register with an E.164 ten digit number.

Examples

The following example shows how to set the MWI for the SIP server and set the individual ephone-dn extension numbers to the MWI SIP server's notification list:

```
Router(config) ephone-dn 1
Router(config-ephone-dn) number 5001
Router(config-ephone-dn) name John Smith
Router(config-ephone-dn) mwi sip

Router(config) telephony-service
Router(config-telephony-service) mwi sip-server 223.223.0.5 transport udp
```

Related Commands

Command	Description
mwi expires	Sets the expire timer for registration for either the client or server.
mwi (ephone-dn)	Configures specific Cisco IP phone directory numbers to receive message waiting indication (MWI) notification from an external voice-mail system.
mwi sip (ephone-dn)	Subscribes an extension in a Cisco IOS Telephony Service router to receive message waiting indication (MWI) notification from a SIP MWI server.
show mwi relay clients	Displays the list of message waiting indication (MWI) relay clients' registration information.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

name (ephone-dn)

To configure a username associated with a directory number, use the **name** command in ephone-dn configuration mode. To disable a username associated with a directory number, use the **no** form of this command.

name *name*

no name *name*

Syntax Description

<i>name</i>	Directory number username.
-------------	----------------------------

Defaults

No default behavior or values

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **name** command configures a username associated with a directory number. The *name* variable information is used to provide caller ID for calls originated on the Cisco IP phone directory number. The **name** command is also used to generate directory information for XML directory accessible from a Cisco IP phone directories button.



Note

You must follow the pattern specified in the **directory** command under the telephony-service configuration mode to associate the username for the directory. The pattern for the surnames for the directory is set either with **first-name-first** or **last-name-first**.

Examples

The following example shows how to configure the username John Smith with the pattern **first-name-first**:

■ name (ephone-dn)

```
Router(config)# ephone-dn 1
Router(config-ephone-dn) name John Smith
```

The following example shows how to configure the username Jane Smith with the pattern **last-name-first**:

```
Router(config)# ephone-dn 1
Router(config-ephone-dn) name Smith, Jane
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
number	Configures a valid number for the Cisco IP phone.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

number (ephone-dn)

To configure a valid number for the Cisco IP phone, use the **number** command in ephone-dn configuration mode. To disable a number for the Cisco IP phone, use the **no** form of this command.

```
number number [secondary number] [no-reg [both | primary]]
```

```
no number number [secondary number] [no-reg [both | primary]]
```

Syntax Description

<i>number</i>	E.164 telephone number.
secondary	(Optional) A second telephone number with an ephone-dn.
no-reg	(Optional) The E.164 numbers in the dial-peer do not register to the gatekeeper. If you do not specify any option (both or primary) after the no-reg keyword, then only the secondary number is not registered.
both	(Optional) Both numbers are not registered.
primary	(Optional) Primary number is not registered.

Defaults

No secondary phone number is associated with the ephone-dn.

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **number** command configures a valid number for the Cisco IP phone. The **secondary** keyword allows you to associate a second telephone number with an ephone-dn so that the Cisco IP phone line can be called by dialing either the main or secondary phone number. The secondary number may contain wildcards; for example, 50.. (number 50 followed by wildcards). The **no-reg** keyword specifies an E.164 number in the dial-peer to not register to the gatekeeper. If you do not specify either **both** or **primary** after the **no-reg** keyword, then only the **secondary** number is not registered.

Examples

The following example shows that 5001 is set as the primary extension number for a Cisco IP phone and 0 as the secondary number. This allows the telephone number 5001 to act as a regular extension number and also to act as the operator line such that callers who dial 0 are routed to the phone line with extension number 5001.

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# number 5001 secondary 0
```

In the following example, 5001 is set as the primary extension number for a Cisco IP phone and “500.” (the number 500 followed by a decimal point) is set as the secondary number. This allows any calls to extension numbers in the range 5000-5009 to be routed to extension 5001 in the event that the actual extension number dialed cannot be found. For example, IP phones may be active in the system with lines that correspond to 5001, 5002, 5004, 5005, and 5009. A call to 5003 or 5006-5009 would be unable to locate a phone with the 5003 or 5006-5008 extensions, so the call would be routed to extension 5001.

```
Router(config-ephone-dn)# number 5001 secondary 500.
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
huntstop	Sets the huntstop attribute for the dial-peers associated with the Cisco IP phone lines.
name	Configures a username associated with a directory number.
preference	Sets preference for the attached dial peer for a directory number.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

paging (ephone-dn)

To set paging numbers that can be called to broadcast an audio page to a group of Cisco IP phones, use the **paging** command in ephone-dn configuration mode. To disable this feature, use the **no** form of this command.

paging [**ip** *multicast-address* **port** *udp-port-number*]

no paging [**ip** *multicast-address* **port** *udp-port-number*]

Syntax Description

ip	(Optional) IP multicast.
<i>multicast-address</i>	(Optional) IP multicast address to use to multicast voice packets for audio paging; for example, 224.0.1.1. Note that multicast addresses always take the form of 224.x.x.x.
port	(Optional) UDP port.
<i>udp-port-number</i>	(Optional) UDP port number to use in association with the IP multicast address. The default is the Skinny Client Protocol port 2000.

Defaults

A Cisco IP phone directory number is not configured as a paging number

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **paging** command configures the ephone-dn number to act as an extension number to use to broadcast audio paging to idle Cisco IP phones. Cisco IP phones must be associated with the paging directory number (ephone-dn) using the ephone-dn tag number of the paging ephone-dn or are included indirectly through a paging group from another paging ephone-dn.

When the optional **ip** keyword followed by the *multicast-address* argument is used, the paging is set for multicast paging. If an IP multicast address is not configured, IP phones are paged individually using IP unicast transmission (to a maximum of ten IP phones). The recommended operation is with an IP multicast address. When multiple paging extensions are configured, each extension should use a unique IP multicast address.

Examples

The following example configures IP multicast paging:

```
Router(config)# ephone-dn 20
Router(config-ephone-dn) number 2000
Router(config-ephone-dn) paging ip 224.0.1.1 port 2000
```

The configuration is as follows:

```
ephone-dn 20
number 2000
paging ip 224.0.1.20 port 2000
```

```
ephone-dn 21
number 2001
paging ip 224.0.1.21 port 2000
```

```
ephone 1
button 1:1
paging-dn 20
```

```
ephone 2
button 1:2
paging-dn 20
```

```
ephone 3
button 1:3
paging-dn 21
```

```
ephone 4
button 1:4
paging-dn 21
```

In this example paging calls to 2000 are multicast to Cisco IP phones (ephones) 1 and 2; paging calls to 2001 go to ephones 3 and 4.

**Note**

The maximum number of unique IP address and router physical interfaces (or subinterfaces) combinations supported for output of audio paging voice packets is ten. Paging using a single IP multicast address that requires output on three different Ethernet interfaces represents use of three counts out of the maximum ten. The limit of ten is likely to be exceeded only if unicast addressing is used for the paging ephone-dn or if individual IP phones are configured for unicast paging support only.

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
paging-dn (ephone)	Sets an audio paging directory number for each Cisco IP phone.
paging group (ephone-dn)	Sets the audio paging directory number for a large combined group.

paging group (ephone-dn)

To set the audio paging directory number for a large combined group, use the **paging group** command in ephone-dn configuration mode. To remove a paging group, use the **no** form of this command.

paging group *paging-ephone-dn-tag-list, paging-ephone-dn-tag-list*

no paging group *paging-ephone-dn-tag-list, paging-ephone-dn-tag-list*

Syntax Description

paging -phone-dn-tag-list A comma-separated list of directory number (DN) tags that are each configured as paging directory numbers. You can include up to ten paging Cisco IP phone DN tags separated by commas; for example, 4, 6, 7, 8.

Defaults

By default, paging is disabled on all Cisco IP phones

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **paging group** command is used to combine small sets of phones associated with individual paging directory numbers (ephone-dns) into a large combined group so that a page can be sent to large numbers of phones at once. To remove a paging group, use the **no** form of the command. All ephone-dn tags included in the list must have the **paging** command set.

The use of paging groups allows phones to participate in a small local paging set (for example, paging to four phones in a company's shipping and receiving department) but also supports company-wide paging when needed (for example by combining the paging sets for shipping and receiving, with paging sets for accounting, customer support, and sales into a paging group).

Examples

The following example shows how to set paging groups:

```
ephone-dn 20
number 2000
```

■ paging group (ephone-dn)

```

paging ip 224.0.1.20 port 2000

ephone-dn 21
number 2001
paging ip 224.0.1.21 port 2000

ephone-dn 22
number 2002
paging ip 224.0.2.22 port 2000
paging group 20,21

ephone 1
button 1:1
paging-dn 20

ephone 2
button 1:2
paging-dn 20

ephone 3
button 1:3
paging-dn 21

ephone 4
button 1:4
paging-dn 21

ephone 5
button 1:5
paging-dn 22

```

In this example, paging calls to 2000 go to Cisco IP phones (ephones) 1 and 2, and paging calls to 2001 go to ephones 3 and 4. Calls to 2002 go to ephones 1, 2, 3, 4, and 5. Ephones 1 and 2 are included in paging directory number (ephone-dn) 22 through membership of ephone-dn 20 in the paging group. Ephones 3 and 4 are included in paging ephone-dn 22 through membership of ephone-dn 21 in the paging group. Ephone 5 is directly subscribed to paging-dn 22. Note that multicast addresses always take the form of 224.x.x.x.

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
paging (ephone-dn)	Sets paging numbers that can be called in order to broadcast an audio page to a group of Cisco IP phones.
paging-dn (ephone)	Sets an audio paging directory number for each Cisco IP phone.

paging-dn (ephone)

To set an audio paging directory number for each Cisco IP phone, use the **paging-dn** command in ephone configuration mode. To disable this feature, use the **no** form of this command.

```
paging-dn paging-dn-number-tag { multicast | unicast }
```

```
no paging-dn paging-dn-number-tag { multicast | unicast }
```

Syntax Description

<i>paging-dn-number-tag</i>	Directory tag number of the paging directory number (ephone-dn) to associate with the Cisco IP phone. Paging calls to the specified ephone-dn sends the page to the Cisco IP phone.
multicast	Multicast paging for groups. By default, audio paging is transmitted to the Cisco IP phone using multicast.
unicast	Unicast paging for a single Cisco IP phone. This keyword indicates that the Cisco IP phone is not capable of receiving audio paging through multicast and requests that the phone receives the audio paging through a unicast transmission directed to the individual phone. Note The number of phones supported through unicast is limited to a maximum of ten phones.

Defaults

By default, paging is disabled on all Cisco IP phones

Command Modes

Ephone configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **paging-dn** command sets an audio paging directory number (DN) for each Cisco IP phone. The audio paging feature operates in a fashion similar to intercom, but provides only one-way voice, with no press-to-answer option. A DN is created, which is associated with a certain number of local IP phones. The paging extension number is configured using the existing **number** command under ephone-dn configuration mode. Multiple paging DNs can be supported for each system. The paging number can be dialed from anywhere, including on-net calls. The paging audio stream is heard on all selected Cisco IP

phones that are in the idle state through the speakerphone mode. The IP phone display shows the “name” information associated with the paging DN used to activate the page. During an active paging, incoming or outgoing call for an answered or initiated call, disconnects the IP phone from the paging output.

The paging mechanism supports audio distribution using IP multicast, replicated unicast, and a mixture of both (so that multicast is used where possible, and unicast is used with specific phones that cannot be reached through multicast).

Each Cisco IP phone can be associated with only one paging directory number (paging-dn); however, paging-dns may be grouped in order to join groups of IP phones together. Only single-level grouping is supported (no support for groups of groups). This allows for paging to IP phones for individual departments (for example, sales, support, shipping, and accounting) and then allows these sets to be combined into a group for “all employees” or “everyone in building 2”. Any number of phones may be added into the same paging set using multicast. A Cisco IP phone (ephone) may directly belong to only a single paging set. A paging set consists of all phones configured with the same paging-dn. Each paging set uses a DN.

Examples

The following example shows how to set up an ephone-dn for multicast paging:

```
ephone-dn 22
name Paging Shipping
number 5001
paging ip 224.1.1.10 port 2000
```

```
ephone 4
mac 0030.94c3.8724
button 1:1 2:2
paging-dn 22 multicast
```

This example creates a paging number for 5001 on ephone-dn 22 and adds ephone 4 as a member of the paging set. Multicast is set for the paging-dn. Note that multicast addresses always take the form of 224.x.x.x.



Note

For unicast paging to all phones, omit the IP multicast address in the ephone-dn configuration. For unicast paging to a specific phone using an ephone-dn configured for multicast, add the **unicast** keyword after the **paging-dn** command in ephone configuration mode.

Each ephone-dn used for paging can support a maximum of ten distinct targets (IP addresses and interfaces). A multicast address counts as a single target for each physical interface in use (regardless of the number of phones connected via the interface). Each unicast target counts as a single target, such that paging that does not use multicast at all is limited to paging ten phones. For example, ten IP phones paged through multicast on Fast Ethernet interface 0/1.1 plus five IP phones paged through multicast on FastEthernet interface 0/1.2, is counted as two targets.

For simultaneous paging to more than one paging ephone-dn, Cisco recommends that you use different IP multicast addresses (not just different port numbers) for paging configuration. Note that multicast addresses always take the form of 224.x.x.x.

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
number	Configures a valid number for the Cisco IP phone.

Command	Description
paging (ephone-dn)	Sets paging numbers that can be called in order to broadcast an audio page to a group of Cisco IP phones.
paging group (ephone-dn)	Sets the audio paging directory number for a large combined group.

pattern direct (vm-integration)

To configure the dual-tone multifrequency (DTMF) digit pattern forwarding necessary to activate the voice-mail system when the user presses the messages button on the phone, use the **pattern direct** command in voicemail integration configuration mode. To disable DTMF digit pattern forwarding when the user presses the messages button on the phone, use the **no** form of this command.

```
pattern direct tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4]
```

```
no pattern direct tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4]
```

Syntax Description

<i>tag</i>	Alphanumeric string fewer than four DTMF digits in length. The alphanumeric string consists of a combination of four letters (A,B,C, and D), two symbols (* and #), and ten digits (0 to 9). The tag numbers match the numbers defined in the voice-mail system's integration file, immediately preceding either the number of the calling party, the number of the called party, or a forwarding number. The Cisco IOS Telephony Service router supports a maximum of four tags.
CGN	Calling number (CGN) information is sent to the voice-mail system.
CDN	Called number (CDN) information is sent to the voice-mail system.
FDN	Forwarding number (FDN) information is sent to the voice-mail system.



Note

Although it is unlikely that you will use multiple instances of the **CGN**, **CDN**, or **FDN** keyword in a single command line, it is permissible to do so.

Defaults

This feature is disabled by default.

Command Modes

Voice-mail integration configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **pattern direct** command is used to configure the sequence of DTMF digits passed to a voice-mail system attached to the Cisco IOS Telephony Service router through one or more voice ports. When a call is placed directly from a Cisco IP phone attached to the Cisco IOS Telephony Service router, the voice-mail system expects to receive a sequence of DTMF digits at the beginning of the call that identify the mailbox of the user calling the voice-mail system accompanied by a string of digits indicating that the caller is attempting to access the designated mailbox in order to retrieve messages.

Examples

The following example sets the DTMF pattern for a calling number (\$CGN) for a direct call to the voice-mail system:

```
Router(config) vm-integration
Router(config-vm-integration) pattern direct 2 CGN
```

Related Commands

Command	Description
pattern ext-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
pattern ext-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
pattern trunk-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an external trunk call reaches a busy extension and the call is forwarded to voicemail.
pattern trunk-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when an external trunk call reaches an unanswered extension and the call is forwarded to voicemail.
vm-integration	Enters voice-mail integration mode and enables voice-mail integration with DTMF and analog voice-mail system.

pattern ext-to-ext busy (vm-integration)

To configure the dual-tone multifrequency (DTMF) digit pattern forwarding necessary to activate the voice-mail system once an internal extension attempts to connect to a busy extension and the call is forwarded to voicemail, use the **pattern ext-to-ext busy** command in voicemail integration configuration mode. To disable DTMF digit pattern forwarding when an internal extension calls a busy extension and the call is forwarded to a voice-mail system, use the **no** form of this command.

```
pattern ext-to-ext busy tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4
```

```
no pattern ext-to-ext busy tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4
```

Syntax Description

<i>tag</i>	Alphanumeric string fewer than four DTMF digits in length. The alphanumeric string consists of a combination of four letters (A,B,C, and D), two symbols (* and #), and ten digits (0 to 9). The tag numbers match the numbers defined in the voice-mail system's integration file, immediately preceding either the number of the calling party, the number of the called party, or a forwarding number. The Cisco IOS Telephony Service router supports a maximum of four tags.
CGN	Calling number (CGN) information is sent to the voice-mail system.
CDN	Called number (CDN) information is sent to the voice-mail system.
FDN	Forwarding number (FDN) information is sent to the voice-mail system.



Note

Although it is unlikely that you will use multiple instances of the **CGN**, **CDN**, or **FDN** keyword in a single command line, it is permissible to do so.

Defaults

This feature is disabled by default.

Command Modes

Voice-mail integration configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **pattern ext-to-ext busy** command is used to configure the sequence of DTMF digits passed to a voice-mail system attached to the Cisco IOS Telephony Service router through one or more voice ports. When a call is routed to the voice-mail system by call forward on busy from a Cisco IP phone attached to the Cisco IOS Telephony Service router, the voice-mail system expects to receive a sequence of digits identifying the mailbox associated with the forwarding phone together with digits that identify the extension number of the calling IP phone.

Examples

The following example sets the DTMF pattern for a local call forwarded on busy to the voice-mail system:

```
Router(config) vm-integration
Router(config-vm-integration) pattern ext-to-ext busy 7 FDN * CGN *
```

Related Commands

Command	Description
pattern direct	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when the user presses the messages button on the phone.
pattern ext-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
pattern trunk-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an external trunk call reaches a busy extension and the call is forwarded to voicemail.
pattern trunk-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when an external trunk call reaches an unanswered extension and the call is forwarded to voicemail.
vm-integration	Enters voice-mail integration mode and enables voice-mail integration with DTMF and analog voice-mail system.

pattern ext-to-ext no-answer (vm-integration)

To configure the dual-tone multifrequency (DTMF) digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail, use the **pattern ext-to-ext no-answer** command in voicemail integration configuration mode. To disable DTMF digit pattern forwarding, use the **no** form of this command.

```
pattern ext-to-ext no-answer tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4]
```

```
no pattern ext-to-ext no-answer tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4]
```

Syntax Description	tag	Alphanumeric string fewer than four DTMF digits in length. The alphanumeric string consists of a combination of four letters (A,B,C, and D), two symbols (* and #), and ten digits (0 to 9). The tag numbers match the numbers defined in the voice-mail system's integration file, immediately preceding either the number of the calling party, the number of the called party, or a forwarding number. The Cisco IOS Telephony Service router supports a maximum of four tags.
	CGN	Calling number (CGN) information is sent to the voice-mail system.
	CDN	Called number (CDN) information is sent to the voice-mail system.
	FDN	Forwarding number (FDN) information is sent to the voice-mail system.



Note

Although it is unlikely that you will use multiple instances of the **CGN**, **CDN**, or **FDN** keyword in a single command line, it is permissible to do so.

Defaults This feature is disabled by default.

Command Modes Voice-mail integration configuration

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **pattern ext-to-ext no-answer** command is used to configure the sequence of DTMF digits passed to a voice-mail system attached to the Cisco IOS Telephony Service router through one or more voice ports. When a call is routed to the voice-mail system by call forward on no-answer from an IP phone attached to the Cisco IOS Telephony Service router, the voice-mail system expects to receive a sequence of digits identifying the mailbox associated with the forwarding phone together with digits that identify the extension number of the calling IP phone.

Examples

The following example sets the DTMF pattern for a local call forwarded on **no-answer** to the voice-mail system:

```
Router(config) vm-integration
Router(config-vm-integration) pattern ext-to-ext no-answer 5 FDN * CGN *
```

Related Commands

Command	Description
pattern direct	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when the user presses the messages button on the phone.
pattern ext-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
pattern trunk-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an external trunk call reaches a busy extension and the call is forwarded to voicemail.
pattern trunk-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when an external trunk call reaches an unanswered extension and the call is forwarded to voicemail.
vm-integration	Enters voice-mail integration mode and enables voice-mail integration with DTMF and analog voice-mail system.

pattern trunk-to-ext busy (vm-integration)

To configure the dual-tone multifrequency (DTMF) digit pattern forwarding necessary to activate the voice-mail system once an external trunk call reaches a busy extension and the call is forwarded to voicemail, use the **pattern trunk-to-ext busy** command in voicemail integration configuration mode. To disable DTMF digit pattern forwarding when an external trunk call reaches a busy extension and the call is forwarded to a voice-mail system, use the **no** form of this command.

```
pattern trunk-to-ext busy tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4
```

```
no pattern trunk-to-ext busy tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4
```

Syntax Description

<i>tag</i>	Alphanumeric string fewer than four DTMF digits in length. The alphanumeric string consists of a combination of four letters (A,B,C, and D), two symbols (* and #), and ten digits (0 to 9). The tag numbers match the numbers defined in the voice-mail system's integration file, immediately preceding either the number of the calling party, the number of the called party, or a forwarding number. The Cisco IOS Telephony Service router supports a maximum of four tags.
CGN	Calling number (CGN) information is sent to the voice-mail system.
CDN	Called number (CDN) information is sent to the voice-mail system.
FDN	Forwarding number (FDN) information is sent to the voice-mail system.



Note

Although it is unlikely that you will use multiple instances of the **CGN**, **CDN**, or **FDN** keyword in a single command line, it is permissible to do so.

Defaults

This feature is disabled by default.

Command Modes

Voice-mail integration configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **pattern trunk-to-ext busy** command is used to configure the sequence of DTMF digits passed to a voice-mail system attached to the Cisco IOS Telephony Service router through one or more voice ports. When a call is routed to the voice-mail system by call forward on busy from an IP phone attached to the Cisco IOS Telephony Service router, the voice-mail system expects to receive a sequence of digits identifying the mailbox associated with the forwarding phone together with digits indicating that the call originated from a PSTN or VoIP caller.

Examples

The following example sets the DTMF pattern for call forwarding when an external trunk call reaches a busy extension and the call is forwarded to the voice-mail system:

```
Router(config) vm-integration
Router(config-vm-integration) pattern trunk-to-ext busy 6 FDN * CGN *
```

Related Commands

Command	Description
pattern direct	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when the user presses the messages button on the phone.
pattern ext-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
pattern ext-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
pattern trunk-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when an external trunk call reaches an unanswered extension and the call is forwarded to voicemail.
vm-integration	Enters voice-mail integration mode and enables voice-mail integration with DTMF and analog voice-mail system.

pattern trunk-to-ext no-answer (vm-integration)

To configure the dual-tone multifrequency (DTMF) digit pattern forwarding necessary to activate the voice-mail system when an external trunk call reaches an unanswered extension and the call is forwarded to voicemail, use the **pattern trunk-to-ext no-answer** command in voicemail integration configuration mode. To disable DTMF digit pattern forwarding when an external trunk call reaches another extension where the called party does not answer and the call is forwarded to a voice-mail system, use the **no** form of this command.

```
pattern trunk-to-ext no-answer tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4]
```

```
no pattern trunk-to-ext no-answer tag1 {CGN | CDN | FDN} [tag2 {CGN | CDN | FDN}]
    [tag3 {CGN | CDN | FDN}] [tag4]
```

Syntax Description

<i>tag</i>	Alphanumeric string fewer than four DTMF digits in length. The alphanumeric string consists of a combination of four letters (A,B,C, and D), two symbols (* and #), and ten digits (0 to 9). The tag numbers match the numbers defined in the voice-mail system's integration file, immediately preceding either the number of the calling party, the number of the called party, or a forwarding number. The Cisco IOS Telephony Service router supports a maximum of four tags.
CGN	Calling number (CGN) information is sent to the voice-mail system.
CDN	Called number (CDN) information is sent to the voice-mail system.
FDN	Forwarding number (FDN) information is sent to the voice-mail system.



Note

Although it is unlikely that you will use multiple instances of the **CGN**, **CDN**, or **FDN** keyword in a single command line, it is permissible to do so.

Defaults

This feature is disabled by default.

Command Modes

Voice-mail integration configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.

Release	Modification
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **pattern trunk-to-ext no-answer** command is used to configure the sequence of DTMF digits passed to a voice-mail system attached to the Cisco IOS Telephony Service router through one or more voice ports. When a call is routed to the voice-mail system by call forward on no-answer from an IP phone attached to the Cisco IOS Telephony Service router, the voice-mail system expects to receive a sequence of digits identifying the mailbox associated with the forwarding phone together with digits indicating that the call originated from a PSTN or VoIP caller.

Examples

The following example sets the DTMF pattern for call forwarding when an external trunk call reaches an unanswered extension and the call is forwarded (FDN) to a voice-mail system:

```
Router(config) vm-integration
Router(config-vm-integration) pattern trunk-to-ext no-answer 4 FDN * CGN *
```

Related Commands

Command	Description
pattern direct	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when the user presses the messages button on the phone.
pattern ext-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
pattern ext-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
pattern trunk-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an external trunk call reaches a busy extension and the call is forwarded to voicemail.
vm-integration	Enters voice-mail integration mode and enables voice-mail integration with DTMF and analog voice-mail system.

preference (ephone-dn)

To set preference order for the directory number associated with a Cisco IP phone, use the **preference** command in ephone-dn configuration mode. To put the directory number in default preference order, use the **no preference** form of this command.

preference *preference-order*

no preference *preference-order*

Syntax Description

<i>preference-order</i>	The preference order is 0 to 10. 0 is the highest preference and 10 is the lowest preference.
-------------------------	---

Defaults

The default is 0 (the highest preference)

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **preference** command sets preference order for the directory number (ephone-dn) associated with a Cisco IP phone. Use the **preference** command to indicate the preference order for matching dial peers in Cisco IP phone virtual dial-peer group. Setting the preference enables the desired dial peer to be selected when multiple dial peers within a hunt group are matched for a dial string.

Examples

The following example sets a preference of 2 for the directory number 3000:

```
Router(config)# ephone-dn 1
Router(config-ephone-dn)# number 3000
Router(config-ephone-dn)# preference 2
```

The configuration is as follows:

```
ephone-dn 4
 number 1222
 preference 0
!
!
ephone-dn 5
 number 1222
 preference 1
```

In this example, number 1222 under directory number (ephone-dn) 4 has a higher preference than the number 1222 under ephone-dn 5.

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
huntstop	Sets the huntstop attribute for the dial-peers associated with the Cisco IP phone lines.
name	Configures a username associated with a directory number.
number	Configures a valid number for the Cisco IP phone.
preference (dial-peer)	Indicates the preferred order of a dial peer within a hunt group.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

reset (ephone)

To reset the Cisco IP phones in ephone configuration mode, use the **reset** command in ephone configuration mode.

reset



Note

The **reset** command does not have a **no** form.

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values

Command Modes

Ephone configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **reset** command resets the Cisco IP phone in ephone configuration mode.

The **reset** command does not have a **no** form.

Examples

The following example shows how to reset the Cisco IP phones:

```
Router(config)# ephone 1
Router(config-ephone)# reset
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

reset (telephony-service)

To reset the Cisco IP phones associated with the Cisco IOS Telephony Service router, use the **reset** command in telephony-service configuration mode.

```
reset {all seconds | mac-address mac-address}
```



Note

The **reset** command does not have a **no** form.

Syntax Description

all	All Cisco IP phones.
<i>seconds</i>	Time interval, in seconds, between each phone reset. The range is from 0 to 15 seconds.
mac-address <i>mac-address</i>	MAC address of a particular Cisco IP phone.

Defaults

No default behavior or values

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **reset** command resets the Cisco IP phones attached to the router. You can use the **all** keyword to reset all Cisco IP phones attached to the router or to reset a specific Cisco IP phone by entering the **mac-address** keyword and the MAC address of that specific Cisco IP phone.

The **reset** command does not have a **no** form.

Examples

The following example shows how to reset all Cisco IP phones:

```
Router(config)# telephony-service
Router(config-telephony-service)# reset all
```

The following example shows how to configure the Cisco IP phone with the MAC address CFBA.321B.96FA:

```
Router(config)# telephony-service
Router(config-telephony-service)# reset mac-address CFBA.321B.96FA
```

Related Commands	Command	Description
	ephone	Enters ephone configuration mode to register Cisco IP phones.
	ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
	telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

show ephone

To display Cisco IP phone output, use the **show ephone** EXEC command.

show ephone [*mac-address* | **summary** | **registered** | **unregistered** | **7910** | **7940** | **7960** | **ringing** | **offhook** | **dn** *dn-tag* | **remote** | **telephone-number** *phone-number*]

Command Modes

<i>mac-address</i>	(Optional) Specifies the MAC address of the Cisco IP phone.
summary	(Optional) Displays summary information for all Cisco IP phones registered with the Cisco IOS Telephony Service router.
registered	(Optional) Displays status information for any Cisco IP phones that are currently registered with the Cisco IOS Telephony Service router.
unregistered	(Optional) Displays status information for all unregistered Cisco IP phones.
7910	(Optional) Displays information about any Cisco 7910 IP Phones registered with the Cisco IOS Telephony Service router.
7940	(Optional) Displays information about any Cisco 7940 IP Phones registered with the Cisco IOS Telephony Service router.
7960	(Optional) Displays information about any Cisco 7960 IP Phones registered with the Cisco IOS Telephony Service router.
ringing	(Optional) Displays status information for all Cisco IP phones registered with the Cisco IOS Telephony Service router that are currently in ringing mode.
offhook	(Optional) Displays a list of Cisco IP phones that are currently engaged or off hook.
dn <i>dn-tag</i>	(Optional) Cisco IP phone associated with a directory number tag.
remote	(Optional) Displays status information about all non-local Cisco IP phones (that is, phones that have no ARP entry).
telephone-number <i>phone-number</i>	(Optional) Displays status information for a Cisco IP phone featuring the specified telephone number.

EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.

Release	Modification
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **show ephone** command displays statistical information for registered and unregistered Cisco IP phones. If a MAC address is not specified, all phones that can be identified by the Cisco IOS Telephony Service router are displayed. This command includes several keywords to enable you to get different types of output specific to your needs.

Examples

The following is a sample output from the **show ephone** command:

```
Router# show ephone

ephone-1 Mac:0003.E3E7.F627 TCP socket:[1] activeLine:1 REGISTERED
mediaActive:1 offhook:1 ringing:0 reset:0 reset_sent:0 debug:0
IP:10.0.0.51 50570 Telecaster 7940 keepalive 49
button 1: dn 1 number 3001 CONNECTED
Active Call on DN 1:3001 10.0.0.51 31808 to 1.2.159.100 22708
Tx Pkts 452 bytes 41584 Rx Pkts 452 bytes 41584 Lost 0
Jitter 0 Latency 0

ephone-2 Mac:0030.94C3.E1A8 TCP socket:[2] activeLine:1 REGISTERED
mediaActive:1 offhook:1 ringing:0 reset:0 reset_sent:0 debug:0
IP:1.2.159.100 50942 Telecaster 7960 keepalive 78
button 1: dn 2 number 3002 CONNECTED
Active Call on DN 2:3002 1.2.159.100 22708 to 10.0.0.51 31808
Tx Pkts 452 bytes 41584 Rx Pkts 452 bytes 41584 Lost 0
Jitter 0 Latency 0

ephone-3 Mac:0030.94C3.F946 TCP socket:[-1] activeLine:0 UNREGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 debug:0
IP:10.2.1.2 52163 Telecaster 7960 keepalive 59

ephone-4 Mac:0030.94C3.F43A TCP socket:[-1] activeLine:0 UNREGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 debug:0
IP:10.2.1.1 51768 Telecaster 7960 keepalive 59
```

The following is a sample output from the **show ephone mac-address** command for the Cisco IP phone with the MAC address 0030.94C3.F43A:

```
Router# show ephone 0030.94c3.f43a

ephone-3 Mac:0030.94C3.F43A TCP socket:[3] activeLine:0 REGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 debug:0
IP:1.5.81.13 Telecaster 7960 keepalive 28
button 1: dn 3 number 5003 IDLE
button 2: dn 5 number 5005 IDLE
button 3: dn 6 number 5006 IDLE
speed dial 1:3005
speed dial 2:3006
```

The following is a sample output from the **show ephone dn dn-tag** command:

```
Router# show ephone dn 5
```

```
Tag 5, Normal or Intercom dn
ephone 1, mac-address 0030.94C3.CAA2, line 2
ephone 2, mac-address 0030.94c2.9919, line 3
```

The following is a sample output from the **show ephone 7910** command:

```
Router# show ephone 7910

ephone-5 Mac:0004.DD1E.56ED TCP socket:[1] activeLine:0 REGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 paging 0 debug:0
IP:10.30.0.83 52234 Telecaster 7910 keepalive 270 max_line 2 dual-line
button 1: dn 15 number 5000 IDLE
button 2: dn 16 number 5500 IDLE
```

The following is a sample output from the **show ephone 7960** command:

```
Router# show ephone 7960

ephone-11 Mac:0007.0EA6.2AA9 TCP socket:[13] activeLine:0 REGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 paging 0 debug:0
IP:10.30.0.53 52548 Telecaster 7960 keepalive 272 max_line 6
button 1: dn 16 number 9001 IDLE
button 2: dn 17 number 9002 IDLE
button 3: dn 18 number 9003 IDLE
button 4: dn 26 number A5001 auto dial A5002 IDLE
button 5: dn 31 number 1111 IDLE
speed dial 1:8001

ephone-12 Mac:0002.B9EB.0CB1 TCP socket:[14] activeLine:0 REGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 paging 0 debug:0
IP:10.30.0.54 50387 Telecaster 7960 keepalive 272 max_line 6
button 1: dn 20 number 9005 IDLE
button 2: dn 21 number 9006 IDLE
button 3: dn 22 number 9007 IDLE
button 4: dn 23 number 9008 IDLE
button 5: dn 30 number 1110 IDLE
```

The following is a sample output from the **show ephone registered** command:

```
Router# show ephone registered

ephone-1 Mac:0653.D6B4.C601 TCP socket:[4] activeLine:0 REGISTERED
ephone-2 Mac:0653.D6B4.C602 TCP socket:[6] activeLine:0 REGISTERED
ephone-3 Mac:0653.D6B4.C603 TCP socket:[2] activeLine:0 REGISTERED
ephone-4 Mac:0653.D6B4.C604 TCP socket:[7] activeLine:0 REGISTERED
ephone-5 Mac:0653.D6B4.C605 TCP socket:[9] activeLine:0 REGISTERED
ephone-6 Mac:0653.D6B4.C608 TCP socket:[1] activeLine:0 REGISTERED
ephone-7 Mac:0653.D6B4.C609 TCP socket:[8] activeLine:0 REGISTERED
ephone-8 Mac:0653.D6B4.C614 TCP socket:[5] activeLine:0 REGISTERED
ephone-9 Mac:0653.D6B4.C622 TCP socket:[11] activeLine:0 REGISTERED
ephone-10 Mac:0653.D6B4.C623 TCP socket:[3] activeLine:0 REGISTERED
ephone-11 Mac:0007.0EA6.2AA9 TCP socket:[13] activeLine:0 REGISTERED
ephone-12 Mac:0002.B9EB.0CB1 TCP socket:[14] activeLine:0 REGISTERED
ephone-13 Mac:0653.D6B4.C625 TCP socket:[10] activeLine:0 REGISTERED
ephone-14 Mac:0653.D6B4.C624 TCP socket:[12] activeLine:0 REGISTERED
```

The following is a sample output from the **show ephone telephone-number *phone-number*** command:

```
Router# show ephone telephone-number 4085998001

DP tag: 1, primary
Tag 1, Normal or Intercom dn
ephone 1, mac-address 0030.94c3.CAA2, line 1
```

Table 4 provides an alphabetic listing of the command fields in the sample output.

Table 4 *show ephone Field Descriptions*

Field	Description
Active Call	An active call is in progress.
activeLine	Indicates the line (button) on the phone that is in use. Zero indicates that no line is in use.
button 1 : dn 1	Shows the directory number (DN) tag number associated with the phone button.
bytes	Total number of voice data bytes sent or received by the Cisco IP phone.
debug	If set to 1, indicates that debug for the phone is enabled; otherwise, it is set to 0.
DP tag	Dial-peer tag for the destination-pattern matching the specified telephone number.
dual_line	Indicates that the dual telephone line feature available on single-line Cisco IP phones (the Cisco 7905 or Cisco 7910, for example) has been activated.
ephone-1	Cisco IP phone tag number.
IDLE	The state of the DN is idle.
IP	Assigned IP address of the Cisco IP phone.
Jitter	The amount of variation (in milliseconds) of the time interval between voice packets received by the Cisco IP phone.
keepalive	Number of keepalive messages received from the Cisco IP phone by the router.
Latency	The estimated playout delay for voice packets received by the Cisco IP phone.
line 1	Indicates which line on the IP phone is associated with the specified telephone number.
Lost	Number of voice packets lost, as calculated by the Cisco IP phone, based on examining voice packet timestamp and sequence numbers during playout.
Mac	MAC address.
max_line	Indicates the maximum number of lines that may be assigned to the Cisco IP phone in question.
mediaActive	If set to 1, indicates that an active conversation is going on; otherwise, it is set to 0.
number	The telephone number associated with the Cisco IP phone button and its DN tag.
offhook	If set to 1, indicates that the Cisco IP phone is off the hook.
paging	Indicates the paging group to which the Cisco IP phone has been assigned.

Table 4 *show ephone Field Descriptions (continued)*

Field	Description
REGISTERED	Indicates that the Cisco IP phone is active and registered. Alternatives states are UNREGISTERED (indicating that the connection to the Cisco IP phone was closed in a normal manner) and DECEASED (indicating that the connection to the Cisco IP phone was closed because of a keepalive timeout).
reset	Pending reset.
reset_sent	Request for reset sent to the Cisco IP phone.
ringing	If set to 1, indicates that the IP phone's ringer is turned on and the phone is ringing; otherwise, it is set to 0.
Rx Pkts	Number of received voice packets.
speed dial	Speed-dial is set to a specific directory number.
Tag number	Specifies the tag number identified in the ephone-dn command output.
TCP socket	Indicates the TCP socket number used to communicate with the IP phone. This can be correlated with the output of various other debug and show commands.
Telecaster <i>model number</i>	Indicates the type and model of the Cisco IP phone. This information is received from the phone during its registration with the router.
Tx Pkts	Number of transmitted voice packets.

The following is a sample output from the **show ephone summary** command:

```
Router# show ephone summary

ephone-1 Mac:0030.94C3.37CB TCP socket:[-1] activeLine:0 REGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 debug:0
IP:10.1.1.1 Telecaster 7910 keepalive 45 1:1
sp1:5002 sp2:5003

ephone-2 Mac:0030.94C3.F96A TCP socket:[-1] activeLine:0 REGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 debug:0
IP:10.1.1.2 Telecaster 7960 keepalive 45 1:2 2:3 3:4
sp1:5004 sp2:5001

ephone-3 Mac:0030.94C3.F946 TCP socket:[-1] activeLine:0 REGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 debug:0
IP:10.2.1.2 Telecaster 7960 keepalive 59

ephone-4 Mac:0030.94C3.F43A TCP socket:[-1] activeLine:0 REGISTERED
mediaActive:0 offhook:0 ringing:0 reset:0 reset_sent:0 debug:0
IP:10.2.1.1 Telecaster 7960 keepalive 59
```


Table 5 provides an alphabetic listing of the command fields in the sample output.

Table 5 *show ephone summary Field Descriptions*

Field	Description
activeLine	Indicates the line (button) on the phone that is in use. Zero indicates that no line is in use
debug	If set to 1, indicates that debug for the phone is enabled; otherwise, it is set to 0.
ephone-1	Cisco IP phone tag number.
IP	Assigned IP address of the Cisco IP phone.
keepalive	Number of keepalive messages received from the IP phone by the router.
Mac	MAC address.
mediaActive	If set to 1, indicates that an active conversation is going on; otherwise, it is set to 0.
offhook	If set to 1, indicates that the phone is off the hook.
REGISTERED	Indicates that the phone is active and registered. Alternatives states are UNREGISTERED (indicating that the connection to the Cisco IP phone was closed in a normal manner) and DECEASED (indicating that the connection to the Cisco IP phone was closed because of a keepalive timeout).
reset	Pending reset.
reset_sent	Request for reset sent to the Cisco IP phone.
ringing	If set to 1, indicates that the Cisco IP phone's ringer is turned on and the phone is ringing; otherwise, it is set to 0.
sp1	Speed-dial 1 set to a directory number.
sp2	Speed-dial 2 set to a directory number.
TCP socket	Indicates the TCP socket number used to communicate with the Cisco IP phone. This can be correlated with the output of various other debug and show commands.
Telecaster <i>model number</i>	Indicates the type and model of the IP phone. This information is received from the phone during its registration with the router.

Related Commands

Command	Description
show ephone-dn	Displays the Cisco IP phone destination number.
show ephone-dn summary	Displays summary of the Cisco IP phone destination numbers.
show telephony-service	Displays the detailed configuration of all Cisco IP phones.

show ephone-dn

To display a Cisco IP phone destination number of the Cisco IOS Telephony Service router, use the **show ephone-dn** EXEC command.

show ephone-dn [*tag* | **summary**]

Syntax Description		
<i>tag</i>	(Optional) Destination number tag. The destination number can be from 1 to 24.	
summary	(Optional) Summary of all Cisco IP phone destination numbers.	

Command Modes EXEC

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Examples

The following is sample output from the **show ephone-dn** command:

```
Router# show ephone-dn 1

EFXS 50/0/1 Slot is 50, Sub-unit is 0, Port is 1
Type of VoicePort is EFXS
Operation State is UP
Administrative State is UP
No Interface Down Failure
Description is not set
Noise Regeneration is enabled
Non Linear Processing is enabled
Music On Hold Threshold is Set to -38 dBm
In Gain is Set to 0 dB
Out Attenuation is Set to 0 dB
Echo Cancellation is enabled
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
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
Ringing Time Out is set to 180 s
Companding Type is u-law
Region Tone is set for US
Wait Release Time Out is 30 s
Station name None, Station number 5001

```

```

Caller ID Info Follows:
Standard BELLCORE

```

```

Voice card specific Info Follows:
Digit Duration Timing is set to 100 ms

```

The following is sample output from the **show ephone-dn summary** command:

```
Router# show ephone-dn summary
```

```

PORT      DN STATE  MWI_STATE  CODEC    VAD      VTSP STATE  VPM STATE
=====  =====  =====  =====  ==  =====  =====
50/0/1    DOWN     NONE       -        -        -           EFXS_ONHOOK
50/0/2    DOWN     SUBSCRIBED -        -        -           EFXS_ONHOOK
50/0/3    DOWN     NONE       -        -        -           EFXS_ONHOOK
50/0/4    DOWN     CONNECTING -        -        -           EFXS_ONHOOK

```

Table 6 provides an alphabetic listing of the command fields in the sample output.

Table 6 *show ephone-dn Field Descriptions*

Field	Description
Administrative State	Administrative (configured) state of the voice port.
Caller ID Info	Information about the caller ID.
CODEC	Codec type.
Companding Type	Not applicable to the Cisco IP phone.
CONNECTING	Contacting MWI Server.
Connection Mode	Not applicable to the Cisco IP phone.
Connection Number	Not applicable to the Cisco IP phone.
Description	Not applicable to the Cisco IP phone.
DN STATE	State of the Cisco IP phone line associated with a directory number (DN).
Echo Cancellation	Not applicable to the Cisco IP phone.
Echo Cancel Coverage	Not applicable to the Cisco IP phone.
EFXS	The voice port type.
In Gain	Not applicable to the Cisco IP phone.
Initial Time Out	Amount of time the system waits for an initial input digit from the caller.
Interdigit Time Out	Amount of time the system waits for a subsequent input digit from the caller.
Music-On-Hold Threshold	Not applicable to the Cisco IP phone.
MWI_STATE	MWI registration status of the extension number.

Table 6 *show ephone-dn Field Descriptions*

Field	Description
No Interface Down Failure	State of the interface.
NONE	DN is not assigned with any MWI type.
Noise Regeneration	Not applicable to the Cisco IP phone.
Non-Linear Processing	Not applicable to the Cisco IP phone.
Operational State	Operational state of the voice port.
Out Attenuation	Not applicable to the Cisco IP phone.
Playout-delay Maximum	Not applicable to the Cisco IP phone.
Playout-delay Mode	Not applicable to the Cisco IP phone.
Playout-delay Nominal	Not applicable to the Cisco IP phone.
Port	Port number for this interface associated with the voice interface card.
Region Tone	Not applicable to the Cisco IP phone.
Ringing Time Out	Ringing time out duration.
Station name	Station name.
Station number	Station number.
Slot	Slot used in the voice interface card for this port.
SUSBCRIBED	Registered with the MWI server.
Sub-unit	Subunit used in the voice interface card for this port.
Type of VoicePort	Indicates the voice port type.
VAD	Voice activity detection.
Voice card specific Info	Information specific to the voice card.
VPM STATE	State indication for the voice port module (VPM) software component.
VTSP STATE	State indication for the voice telephony service provider (VTSP) software component.
Wait Release Time Out	The time that a voice port stays in the call-failure state while the router sends a busy tone, reorder tone, or an out-of-service tone to the port.

Related Commands

Command	Description
show ephone	Displays Cisco IP phone output.

show ephone-dn loopback

To display information about loopback ephone-dns that have been created in a Cisco CallManager Express (Cisco CME) system, use the **show ephone-dn loopback** command in privileged EXEC mode.

show ephone-dn loopback

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)YD	This command was introduced on the Cisco 2600 series, Cisco 3600 series, and Cisco IAD2420 series.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745.
12.2(8)T1	This command was implemented on the Cisco 2600XM and Cisco 2691.
12.2(11)T	This command was implemented on the Cisco 1760.

Examples

The following example displays information for a loopback using ephone-dn 21 and ephone-dn 22:

```
Router# show ephone-dn loopback
```

```
LOOPBACK DN status (min 21, max 22):
DN 21 51... Loopback to DN 22 CH1 IDLE
CallingDn -1 CalledDn -1 Called Calling G711Ulaw64k
Strip NONE, Forward 2, prefix 10 retry 10 Media 0.0.0.0 0
callID 0 srcCallID 0 ssrc 0 vector 0
DN 22 11... Loopback to DN 21 CH1 IDLE
CallingDn -1 CalledDn -1 Called Calling G711Ulaw64k
Strip NONE, Forward 2, prefix 50 retry 10 Media 0.0.0.0 0
callID 0 srcCallID 0 ssrc 0 vector 0
```

Significant fields in the output from this command are described in [Table 1](#), in alphabetical order.

Table 1 show ephone-dn loopback Field Descriptions

Field	Description
Called, Calling	Called number and calling number when there is a call present.
CalledDn, CallingDn	Ephone-dn tag numbers of the called and calling ephone-dn. Set to -1 if the call is not to or from an ephone-dn, or if there is no active call.
callID	Internal call reference. This usage is the same as in other Cisco IOS voice gateway commands.
DN	Ephone-dn tag (sequence number).

Table 1 *show ephone-dn loopback Field Descriptions (continued)*

Field	Description
Forward	Number of digits in the original called number to forward to the other ephone-dn in the loopback-dn pair.
G711...	G711Ulaw64k indicates G.711 codec, mu-law, 64000-bit stream. G711alaw64k indicates G.711 codec, a-law, 64000-bit stream.
Loopback to ...	Indicates the opposite ephone-dn in the loopback pair and the status of that ephone-dn.
Media	IP destination address, if any, for any voice packets that are passing through the loopback DN
min, max	Lowest and highest dn-tag numbers of ephone-dns that are configured as loopback-dns.
prefix	Digit string to add to the beginning of forwarded called numbers.
retry	Number of seconds to wait before retrying the loopback target when busy.
srcCallID	Internal call reference for the destination.
ssrc	RTP synchronization source (SSRC) of the most recent RTP packet.
Strip	Number of leading digits to strip before forwarding to the other extension in the loopback-dn pair.
vector	The following values describe the media path for voice packets that pass through the loopback-dn: <ul style="list-style-type: none"> • 0—No media path or not a loopback-dn path (inactive). • 1—Normal path. Loopback-dn has identified the final media destination as a local IP phone. The media IP address field shows a valid, non-zero value. • 2—Hairpin. Media packets are routed back through paired loopback-dns. The final destination is not known. For example, this can be a VoIP-to-VoIP call path by a loopback-dn. • 3—Hairpin. The final destination is an ephone-dn in a special mode such as paging. • 4—Loopback-dn chain has been detected, in which two loopback-dn pairs have been connected together. • 5—Loopback-dn chain has been detected in which more than two loopback-dn pairs are connected in series.

Related Commands

Command	Description
loopback-dn	Creates a virtual loopback voice port (loopback-dn) to establish a demarcation point for VoIP voice calls and supplementary services.
show ephone-dn	Displays status and information or call statistics for one ephone-dn or all ephone-dns in a Cisco CME system.

show mwi relay clients

To display registration information for the list of message waiting indication (MWI) relay clients, use the **show mwi relay** EXEC command.

show mwi relay clients

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The **show mwi relay command** displays registration information for the list of message waiting indication (MWI) relay clients.

Examples The following is sample output from the **show mwi relay clients** command:

```
Router# show mwi relay clients

Client                IPADDR                EXPIRES(sec)  MWI
=====  =====  =====  =====
4089028653           1.8.17.25             89077         ON
6508876543           1.8.17.34             87654         OFF
```

Related Commands	Command	Description
	mwi relay	Enables the Cisco IOS Telephony Service router to relay message waiting indication (MWI) information to remote Cisco IP phones.

show telephony-service admin

To display the username and password association of the local administrator of the Cisco IOS Telephony Service router, use the **show telephony-service admin** EXEC command.

show telephony-service admin

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Examples The following is sample output from the **show telephony-service admin** command:

```
Router# show telephony-service admin
admin_username Admin
admin_password word
edit DN through Web: enabled.
edit TIME through web: enabled.
assign IP Address through Web: disabled.
```

Related Commands	Command	Description
	show telephony-service all	Displays the detailed configuration of all the Cisco IP phones.
	show telephony-service dial-peer	Displays Cisco IP phone dial peers of the Cisco IOS Telephony Service router.
	show telephony-service ephone-dn	Displays Cisco IP phone destination number output of the Cisco IOS Telephony Service router.
	show telephony-service voice-port	Displays the virtual voice-port configuration of the Cisco IOS Telephony Service router.

show telephony-service all

To display the detailed configuration of all Cisco IP phones, voice ports, and dial peers of the Cisco IOS Telephony Service router, use the **show telephony-service all** EXEC command.

show telephony-service all

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Examples The following is sample output from the **show telephony-service all** command:

```
Router# show telephony-service all

CONFIG
=====
ip source-address 10.0.0.1 port 2000
max-ephones 24
max-dn 24
dialplan-pattern 1 408734....
voicemail 11111
transfer-pattern 510734....
keepalive 30

ephone-dn 1
number 5001
huntstop

ephone-dn 2
number 5002
huntstop
call-forward noan 5001 timeout 8

ephone-dn 3
number 5003
```

```

huntstop

ephone 1
mac-address 0030.94C3.37CB
type 0
button 1:1
speed-dial 1 5002
speed-dial 2 5003
cos 0
!
ephone 2
mac-address 0030.94C3.F96A
type 0
button 1:2 2:3 3:4
speed-dial 1 5004
speed-dial 2 5001
cos 0
!

voice-port 50/0/1
station-id number 5001
!
voice-port 50/0/2
station-id number 5002
timeout ringing 8
!

dial-peer voice 20025 pots
destination-pattern 5001
huntstop
port 50/0/1

dial-peer voice 20026 pots
destination-pattern 5002
huntstop
call-forward noan 5001
port 50/0/2

dial-peer voice 20027 pots
destination-pattern 5003
huntstop
port 50/0/3

```

Table 7 provides an alphabetic listing of the command fields in the sample output.

Table 7 show telephony-service all Field Descriptions

Field	Description
button	Button on the Cisco IP phone.
call-forward noan	Call forward no answer is set.
cos	Not applicable; unused.
destination-pattern	Destination pattern (telephone number) configured for this dial peer.
dial-peer voice	Voice dial peer.

Table 7 *show telephony-service all Field Descriptions*

Field	Description
dialplan-pattern	Dial-plan pattern is set to expand the abbreviated extension numbers to fully qualified E.164 numbers.
ephone	Cisco IP phone.
ephone-dn	Cisco IP phone directory number.
huntstop	Huntstop is set.
ip source address	IP address used by Cisco IP phones to register with the router for service.
keepalive	The IP phone keepalive period in seconds.
mac-address	MAC address.
max-ephones	Maximum numbers of Cisco IP phones.
max-dn	Maximum directory numbers.
number	Cisco IP phone number.
port	The TCP port number used by Cisco IP phones to communicate with the router.
pots	Plain Old Telephone Service (POTS) dial peer set.
station-id number	The number used for caller ID purposes when calls are made using the line.
speed-dial	Speed-dial is set.
timeout	Timeout is set.
timeout ringing	The maximum amount of time that the phone is allowed to ring before the call is disconnected.
transfer-pattern	Transfer pattern is set to allow transfer of calls to a specified number.
type	Not applicable; unused.
voicemail	A voice-mail (speed-dial) number is set.
voice-port	(Virtual) voice port designator.

Related Commands

Command	Description
show telephony-service dial-peer	Displays Cisco IP phone dial peers of the Cisco IOS Telephony Service router.
show telephony-service voice-port	Displays the virtual voice port configuration of the Cisco IOS Telephony Service router.

show telephony-service dial-peer

To display the Cisco IP phone dial peers of the Cisco IOS Telephony Service router, use the **show telephony-service dial-peer EXEC** command.

show telephony-service dial-peer

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The dial peers cannot be edited manually. You can change the dial peers by entering the **ephone-dn** command.

Examples The following is sample output from the **show telephony-service dial-peer** command:

```
Router# show telephony-service dial-peer

dial-peer voice 20025 pots
 destination-pattern 5001
 huntstop
 port 50/0/1

dial-peer voice 20026 pots
 destination-pattern 5002
 huntstop
 call-forward noan 5001
 port 50/0/2

dial-peer voice 20027 pots
 destination-pattern 5003
 huntstop
 port 50/0/3
```

```
dial-peer voice 20028 pots
destination-pattern 5004
huntstop
port 50/0/4
```

Table 8 provides an alphabetic listing of the command fields in the sample output.

Table 8 *show telephony-service dial-peer Field Descriptions*

Field	Description
destination pattern	Destination pattern (telephone number) configured for this dial peer.
dial-peer voice	Voice dial peer.
huntstop	Huntstop is set.
port	(Virtual) voice port designator.
pots	Plain Old Telephone Service (POTS) dial peer set.

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
show telephony-service all	Displays the detailed configuration of all the Cisco IP phones.
show telephony-service ephone-dn	Displays Cisco IP phone destination number output of the Cisco IOS Telephony Service router.
show telephony-service voice-port	Displays the virtual voice-port configuration of the Cisco IOS Telephony Service router.

show telephony-service ephone

To display configuration for the Cisco IP phones, use the **show telephony-service ephone EXEC** command.

show telephony-service ephone

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Examples The following is sample output from the **show telephony-service ephone** command:

```
Router# show telephony-service ephone
```

```
ephone 1
mac-address 0030.94C3.37CB
type 0
button 1:1
speed-dial 1 5002
speed-dial 2 5003
cos 0
!
ephone 2
mac-address 0030.94C3.F96A
type 0
button 1:2 2:3 3:4
speed-dial 1 5004
speed-dial 2 5001
cos 0
!
```

[Table 9](#) provides an alphabetic listing of the command fields in the sample output.

Table 9 *show telephony-service ephone Field Descriptions*

Field	Description
button	Button on the Cisco IP phone.
cos	Not applicable/unused.
ephone	Cisco IP phone.
mac-address	MAC address of the Cisco IP phone.
type	Not applicable; unused.
speed-dial	Speed-dial is set.

Related Commands

Command	Description
show telephony-service all	Displays the detailed configuration of all the Cisco IP phones.
show telephony-service dial-peer	Displays the Cisco IP phone dial peers of the Cisco IOS Telephony Service router.
show telephony-service ephone-dn	Displays the Cisco IP phone destination number output of the Cisco IOS Telephony Service router.
show telephony-service voice-port	Displays the virtual voice-port configuration of the Cisco IOS Telephony Service router.

show telephony-service ephone-dn

To display the Cisco IP phone destination number output of the Cisco IOS Telephony Service router, use the **show telephony-service ephone-dn EXEC** command.

show telephony-service ephone-dn

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Examples The following is sample output from the **show telephony-service ephone-dn** command:

```
Router# show telephony-service ephone-dn

ephone-dn 1
number 5001
huntstop

ephone-dn 2
number 5002
huntstop
call-forward noan 5001 timeout 8

ephone-dn 3
number 5003
huntstop

ephone-dn 4
number 5004
huntstop
```

[Table 10](#) provides an alphabetic listing of the command fields in the sample output.

Table 10 *show telephony-service ephone-dn Field Descriptions*

Field	Description
call-forward noan	Call forward is set to no answer. Other available options are call-forward busy and call-forward all.
ephone-dn	Cisco IP phone directory number.
huntstop	Huntstop is set.
number	Cisco IP phone number.
timeout	Timeout setting for call-forwarding during no answer.

Related Commands

Command	Description
show telephony-service all	Displays the detailed configuration of all the Cisco IP phones.
show telephony-service dial-peer	Displays the Cisco IP phone dial peers of the Cisco IOS Telephony Service router.
show telephony-service voice-port	Displays the virtual voice-port configuration of the Cisco IOS Telephony Service router.

show telephony-service voice-port

To display virtual voice-port configuration of the Cisco IOS Telephony Service router, use the **show telephony-service voice-port EXEC** command.

show telephony-service voice-port

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
	12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines Displays virtual voice port configuration of the Cisco IOS Telephony Service router. Each Cisco IP phone corresponds to a virtual voice port. For example, Cisco IP phone directory number 7 corresponds to virtual voice port 50/0/7. The virtual voice-port provides the telephone line associated with the Cisco IP phone directory number (ephone-dn).

Examples The following is sample output from the **show telephony-service voice-port** command:

```
Router# show telephony-service voice-port

voice-port 50/0/1
  station-id number 5001
!
voice-port 50/0/2
  station-id number 5002
  timeout ringing 8
!
voice-port 50/0/3
  station-id number 5003
!
voice-port 50/0/4
  station-id number 5004
!
```

Table 11 provides an alphabetic listing of the command fields in the sample output.

Table 11 *show telephony-service voice-port Field Descriptions*

Field	Description
station-id number	The phone number used for caller ID purposes for calls made from this voice port.
timeout ringing	The maximum amount of time that the phone is allowed to ring before the call is disconnected.
voice-port	(Virtual) voice port.

Related Commands

Command	Description
show telephony-service all	Displays the detailed configuration of all the Cisco IP phones.
show telephony-service dial-peer	Displays the Cisco IP phone dial peers of the Cisco IOS Telephony Service router.
show telephony-service ephone-dn	Displays the Cisco IP phone destination number output of the Cisco IOS Telephony Service router.

speed-dial (ephone)

To set speed-dial buttons on a Cisco IP phone, use the **speed-dial** command in ephone configuration mode. To disable speed-dial buttons on a Cisco IP phone, use the **no** form of this command.

speed-dial *button-number directory-number*

no speed-dial *button-number directory-number*

Syntax Description

<i>button-number</i>	Speed-dial string tag for the Cisco IP phone speed-dial button number. The button number ranges from 1 to 4.
<i>directory-number</i>	Directory number on a phone.

Defaults

No default behavior or values

Command Modes

Ephone configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **speed-dial** command sets speed-dial buttons on a Cisco IP phone.



Note

If more speed-dial buttons are defined than are actually supported by the physical phone, then the extra speed-dial configurations are ignored.



Note

Although 20 speed dials can be configured on the Cisco IP phone, ATA phones support only 9 speed-dials with Cisco IOS Telephony Service: *1, *2, *3, *4, *5, *6, *7, *8, and *9.

Examples

The following example shows how to set the speed-dial button 1 for the directory number 5001:

```
Router(config)# ephone 1
Router(config-ephone)# speed-dial 1 5001
```

Related Commands

Command	Description
ephone	Enters ephone configuration mode to register Cisco IP phones.

telephony-service

To enable Cisco IOS Telephony Service and enter telephony-service configuration mode, use the **telephony-service** command in global configuration mode. To disable Cisco IOS Telephony Service, use the **no** form of this command.

telephony-service

no telephony-service

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Global configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **telephony-service** command is the top-level command for all other commands related to Cisco IOS Telephony Service configuration.

Examples

The following example shows how to enter the telephony-service configuration mode:

```
Router(config)# telephony-service
Router(config-telephony-service)#
```

Related Commands

Command	Description
dialplan-pattern	Creates a global prefix that can be used to expand the abbreviated extension numbers into fully qualified E.164 numbers.
ephone	Enters ephone configuration mode to register Cisco IP phones.

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
ip source-address	Identifies the IP address and port number that the Cisco IOS Telephony Service router uses for the IP phone service.
keepalive	Configures the time interval between sending keepalive messages to the router used by the Cisco IP phones.
load	Downloads the Cisco IP phone firmware used by the Cisco IP phone type.
max-dn	Configures the maximum number of directory numbers supported by the Cisco IOS Telephony Service router.
max-ephones	Configures the maximum number of Cisco IP phones supported by the Cisco IOS Telephony Service router.
reset	Resets the Cisco IP phone.
timeouts interdigit	Configures the interdigit timeout value for all Cisco IP phones attached to the router.
transfer-pattern	Allows transfer of telephone calls to other non-IP phone numbers.
url	Provisions URLs for use by the Cisco IP phones connected to the Cisco IOS Telephony Service router.
voicemail	Configures the telephone number that is speed-dialed when the message button on a Cisco IP phone is pressed.

time-format (telephony-service)

To set the time display format on all the Cisco IP phones attached to the router, use the **time-format** command in telephony-service configuration mode. To disable the time display format, use the **no** form of this command.

time-format {12 | 24}

no time-format {12 | 24}

Syntax Description	12	Set in 12-hour increments.
	24	Set in 24-hour increments.

Defaults The default is set to 12 hours.

Command Modes Telephony-service configuration

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The **time-format** command sets the time display format on all the Cisco IP phones attached to the router.

Examples The following example sets the time format on the Cisco IP phones to the 24-hour setting:

```
Router(config)# telephony-service
Router(config-telephony-service)# time-format 24
```

Related Commands	Command	Description
	telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

timeouts interdigit (telephony-service)

To configure the interdigit timeout value for all Cisco IP phones attached to the router, use the **timeouts interdigit** command in telephony-service configuration mode. To disable the interdigit timeout value, use the **no** form of this command.

timeouts interdigit *seconds*

no timeouts interdigit *seconds*

Syntax Description

seconds Interdigit timeout duration, in seconds, set on the timer for all the Cisco IP phones. Valid entries are from 2 to 120 seconds.

Defaults

The default is 10 seconds.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XB	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **timeouts interdigit** command specifies the number of seconds the system waits after a caller enters the initial digit or a subsequent digit of the dialed string. The timeouts interdigit timer is activated when the caller enters a digit and is restarted each time the caller enters subsequent digits until the destination address is identified. If the configured timeout value is exceeded before the destination address is identified, a tone sounds and the call is terminated. The default is 10 seconds.

To disable the timeouts interdigit timer, set the *seconds* value to zero.

Examples

The following example shows the interdigit timeout value set to 5 seconds for all Cisco IP phones:

```
Router(config)# telephony-service
Router(config-telephony-service)# timeouts interdigit 5
```

In this example, the 5 seconds refers to the time in seconds after which an incompletely dialed number will timeout. For example, if you dial nine digits (408739898) instead of the required 10 digits (4087398984) you hear a busy tone after 5 “timeout” seconds.

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
timeouts interdigit	Configures the interdigit timeout value for a specified voice port.

time-webedit (telephony-service)

To enable setting time through the web interface, use the **time-webedit** command in telephony-service configuration mode. To disable this feature, use the **no** form of this command.

time-webedit

no time-webedit

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Telephony-service configuration

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The **time-webedit** command allows a local administrator of the Cisco IOS Telephony Service router to change and set time through the graphical user interface (GUI).

Examples The following example shows how to enable web editing of time:

```
Router(config)# telephony-service
Router(config-telephony-service)# time-webedit
```

Related Commands	Command	Description
	dn-webedit	Enables adding of directory numbers through a web interface.
	telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

transfer-pattern (telephony-service)

To allow transfer of telephone calls by Cisco IP phones to other phone numbers, use the **transfer-pattern** command in telephony-service configuration mode. To disable transfer of calls to other numbers, use the **no** form of this command.

transfer-pattern *transfer-pattern*

no transfer-pattern

Syntax Description

transfer-pattern Digit string for permitted call transfers.

Defaults

Cisco IP phone to Cisco IP phone transfer only.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **transfer-pattern** command allows you to transfer a call to non-IP phone numbers. The call is established between the other calling party and the new recipient. By default, all Cisco IP phone directory numbers are allowed as transfer targets.

Examples

The following example shows how to set the transfer pattern:

```
Router(config)# telephony-service
Router(config-telephony-service)# transfer-pattern 52540..
```

A maximum of 32 transfer patterns can be entered. In the previous example, 52540.. (the two decimal points are used here as wild cards) permits transfers to any numbers in the range 525-4000 to 525-4099.

Related Commands

Command	Description
ephone	Enters ephone configuration mode.
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

translate (ephone-dn)

To select a translation rule to numbers dialed by the Cisco IP phone users, use the **translate** command in ephone-dn configuration mode. To disable this feature, use the **no** form of this command.

translate { **called** | **calling** } *translation rule tag*

no translate { **called** | **calling** } *translation rule tag*

Syntax Description

called	Translate the called number.
calling	Translate the calling number.
<i>translation rule tag</i>	The tag number by which the rule set is referenced. This is an arbitrarily chosen number. The range is 1 to 2,147,483,647.

Defaults

No default behavior or values

Command Modes

Ephone-dn configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **translate** command allows you to select a preconfigured number translation rule to modify the number dialed by a specific extension (ephone-dn). The **called** keyword translates the called number, and the **calling** keyword translates the calling number.



Note

For the **translate** command to take effect, appropriate translation rules should be created on the VoIP configuration level.

Translation rules are a powerful general purpose number manipulation mechanism supported by Cisco IOS that can be used to perform operations such as automatically adding telephone area and prefix codes to dialed numbers. The translation rules are applied to the voice ports created by the ephone-dn.

Examples

The following example shows how to set translation rule 20 to the number called by the Cisco IP phone:

```
Router(config)# translation-rule 20
Router(config-translate)# rule 0 1234 2345 abbreviated
Router(config)# ephone-dn 1
Router(config-ephone-dn) translate called 20
```

Related Commands

Command	Description
ephone-dn	Enters ephone-dn configuration mode and configures the directory numbers for the Cisco IP phone lines.
translation-rule	Creates a translation name and enters translation-rule configuration mode.

url (telephony-service)

To provision URLs for the Cisco IP phones connected to the Cisco IOS Telephony Service router, use the **url** command in telephony-service configuration mode. To remove URLs, use the **no** form of this command.

```
url {directory | information | messages | services} url
```

```
no url {directory | information | messages | services} url
```

Syntax Description

directory	The directory URL.
information	The information URL.
messages	The messages URL.
services	The services URL.
<i>url</i>	An URL string.

Defaults

By default, the router automatically uses the local directory service.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **url** command provisions URLs for use by the connected Cisco IP phones. The Cisco IP Phone 7960 and Cisco IP Phone 7940 can support four URLs in association with the four programmable feature keys on the IP phones. The four feature keys are directories, information, messages, and services. (The fifth key—settings—is managed entirely by the phone.) Operation of these services is determined by the Cisco IP phone capabilities and the content of the referenced URL. The purpose of the **url** command is simply to provision the URLs through the SEPDEFAULT.cnf configuration file supplied by the Cisco IOS Telephony Service router to the Cisco IP phones during phone registration. You can disable local directory by entering **url directories none**. You must reset the Cisco IP phones before the **url** command can take effect.

**Note**

Provisioning of the directory URL to select an external directory resource disables the Cisco IOS Telephony Service local directory service.

Examples

The following example shows how to configure the **url** command to provision the **information**, **directories**, and **services** keys:

```
Router(config) telephony-service
Router(config-telephony-service) url information
http://1.4.212.4/CCMUser/GetTelecasterHelpText.asp
Router(config-telephony-service) url directories http://1.4.212.11/localdirectory
Router(config-telephony-service) url services http://1.4.212.4/CCMUser/123456/urltest.html
```

The **messages** key is configured by the **voicemail** command. This key acts like a redial key to retrieve messages from a specified telephone number.

Related Commands

Command	Description
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.

username (ephone)

To assign a phone user a login account username and password to permit user login to the Cisco IOS Telephony Service router through a web browser, use the **username** command in ephone configuration mode. To disable this feature, use the **no** form of this command.

username *username* **password** *password*

no username *username* **password** *password*

Syntax Description

<i>username</i>	The username of the local Cisco IP phone user.
password	Enables password for the Cisco IP phone user.
<i>password</i>	Password string.

Defaults

The default username for the administrator is Admin.

Command Modes

Ephone configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **username** command assigns a login account username and password for a phone user and establishes a login account associated with each Cisco IP phone (ephone).

A login account must also be created to allow Telephone Application Programming Interface (TAPI)-aware PC applications to register with the Cisco IOS Telephony Service router and exercise remote control operation of a Cisco IP phone.



Note

This configuration can be completed only by you, the local system administrator of the Cisco IOS Telephony Service router.

This configuration permits the phone user to log in to the Cisco IOS Telephony Service to view and change attributes associated only with the user's IP phone.

Examples

The following example shows how to set the username and password:

```
Router(config)# ephone 1
Router(config-ephone)# username sganesh password 9golf
```

Related Commands

Command	Description
admin-password	Sets a password for the local system administrator of the Cisco IOS Telephony Service.
admin-username	Sets the username for the local system administrator of the Cisco IOS Telephony Service router.
ephone	Enters ephone configuration mode to register Cisco IP phones.

vm-device-id (ephone)

To define the voice-mail ID string, use the **vm-device-id** command in ephone configuration mode. To disable this feature, use the **no** form of this command.

vm-device-id *id-string*

no command *id-string*

Syntax Description

<i>id-string</i>	Voice-mail device port identification (ID) string. For example, CiscoUM-VI1 for the first port and CiscoUM-VI2 for the second port.
------------------	---

Defaults

No default behavior or values

Command Modes

Ephone configuration

Command History

Release	Modification
12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **vm-device-id** command defines the voice-mail device ID string. The voice-mail port registers with a device-ID instead of a MAC address. To distinguish among different voice-mail ports, voice-mail device ID is used. The voice-mail device ID is configured to a Cisco IP phone port which maps to a corresponding voice-mail port.

Examples

The following example shows how to set the voice-mail device ID to CiscoUM-VI1:

```
Router(config) ephone 1
Router(config-ephone) vm-device ID CiscoUM-VI1
```

Related Commands

Command	Description
voicemail (telephony-service)	Configures the telephone number that is speed-dialed when the message button on a Cisco IP phone is pressed.

vm-integration

To enter voice-mail integration configuration mode and enable voice-mail integration with dual tone multifrequency (DTMF) and analog voice-mail systems, use the **vm-integration** command in global configuration mode. To disable voice-mail integration, use the **no** form of this command.

vm-integration

no vm-integration

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes Global configuration

Command History	Release	Modification
	12.2(2)XT	This command was introduced on the following platforms: Cisco 1750, Cisco 1751, Cisco 2600 series, and Cisco 3600 series multiservice routers; and Cisco IAD2420 series IADs.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
	12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines The **vm-integration** command allows you to enter the voice-mail integration configuration mode and allows integration with DTMF and analog voice-mail systems.

Examples The following example shows how to enter the voice-mail integration configuration mode:

```
Router(config) vm-integration
Router(config-vm-integration)
```

Related Commands	Command	Description
	pattern direct	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when the user presses the messages button on the phone.
	pattern ext-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
	pattern ext-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an internal extension fails to connect to an extension and the call is forwarded to voicemail.
	pattern trunk-to-ext busy	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system once an external trunk call reaches a busy extension and the call is forwarded to voicemail.
	pattern trunk-to-ext no-answer	Configures the DTMF digit pattern forwarding necessary to activate the voice-mail system when an external trunk call reaches an unanswered extension and the call is forwarded to voicemail.

voicemail (telephony-service)

To configure the telephone number that is speed-dialed when the message button on a Cisco IP phone is pressed, use the **voicemail** command in telephony-service configuration mode. To disable the messages button, use the **no** form of this command.

voicemail *phone-number*

no voicemail

Syntax Description

<i>phone-number</i>	The phone number that is configured as a speed-dial number to retrieve messages.
---------------------	--

Defaults

No phone number is configured and the messages button is ineffective.

Command Modes

Telephony-service configuration

Command History

Release	Modification
12.1(5)YD	This command was introduced on the following platforms: Cisco 2600 series and Cisco 3600 series multiservice routers, and Cisco IAD2420 series IADs.
12.2(2)XT	This command was implemented on the Cisco 1750 and Cisco 1751 multiservice routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T and implemented on the Cisco 3725 and Cisco 3745 routers.
12.2(8)T1	This command was implemented on the Cisco 2600-XM and Cisco 2691 routers.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the Cisco 1760 routers.

Usage Guidelines

The **voicemail** command configures the telephone number that is speed-dialed when the message button on a Cisco IP phone is pressed. The same telephone number is configured for voice mail for all Cisco IP phones connected to the router.

The default behavior is that no phone number is configured and the messages button is ineffective.

Examples

The following example shows that the phone number 914085551000 is set as the speed-dial number that is dialed to retrieve messages when the messages button is pressed:

```
Router(config)# telephony-service
Router(config-telephony-service)# voicemail 914085551000
```

The number 914085551000 is called when the Cisco IP phone messages button is pressed to retrieve messages.

Related Commands

Command	Description
telephony-service	Enables Cisco IOS Telephony Service and enters telephony-service configuration mode.
vm-device-id (ephone)	Defines the voice-mail ID string.