# Before You Begin

**Last Updated: July 31, 2007**

This module describes general decisions that you should make before you configure Cisco Unified Communications Manager Express (Cisco Unified CME), information about tools for configuring Cisco Unified CME, and the work flow for creating or modifying a telephony configuration.

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## Prerequisites for Configuring Cisco Unified CME

- We recommend that you complete the worksheets to gather required site-specific information for the Cisco router to be configured. See the worksheet set at http://www.cisco.com/en/US/products/sw/voicesw/ps4625/prod_configuration_guide09186a00807 59201.html#wp1007671.

**Note** Even though the worksheet set is for configuring a Typical (recommended) installation of an IP telephony system using Cisco Unified Communications Express - QCT, the information is required to create a telephony configuration using any of the configuration methods.

- Base Cisco Unified CME feature license and phone user licenses that entitle you to use Cisco Unified CME are purchased.

**Note** To support H.323 call transfers and forwards to network devices that do not support the H.450 standard, such as Cisco Unified Communications Manager, a tandem gateway is required in the network. The tandem gateway must be running Cisco IOS release 12.3(7)T or a later release and requires the Integrated Voice and Video Services feature license (FL-GK-NEW-xxx), which includes H.323 gatekeeper, IP-to-IP gateway, and H.450 tandem functionality.

- Your IP network is operational and you can access Cisco web.
- You have a valid Cisco.com account.
- You have access to a TFTP server for downloading files.
- Cisco router with all recommended services hardware for Cisco Unified CME is installed. For installation information, see the "How to Install Cisco Voice Services Hardware" section on page 69.
- Recommended Cisco IOS IP Voice or higher image is downloaded to flash memory in the router.
  - To determine which Cisco IOS software release supports the recommended Cisco Unified CME version, see the *Cisco Unified CME and Cisco IOS Software Compatibility Matrix*.
  - For a list of features for each Cisco IOS Software release, see the Feature Navigator at http://tools.cisco.com/ITDIT/CFN/jsp/index.jsp.
  - For installation information, see the "How to Install Cisco IOS Software" section on page 72.
- VoIP networking must be operational. For quality and security purposes, we recommend separate virtual LANs (VLANs) for data and voice. The IP network assigned to each VLAN should be large enough to support addresses for all nodes on that VLAN. Cisco Unified CME phones receive their IP addresses from the voice network, whereas all other nodes such as PCs, servers, and printers receive their IP addresses from the data network. For configuration information, see the "How to Configure VLANs on a Cisco Switch" section on page 73.

# Restrictions for Configuring Cisco Unified CME

- Cisco Unified CME cannot register as a member of a Cisco Unified Communications Manager cluster.
- For conferencing and music on hold (MOH) support with G.729, hardware digital signal processors (DSPs) are required for transcoding G.729 between G.711.
- After a three-way conference is established, a participant cannot use call transfer to join the remaining conference participants to a different number.
- Cisco Unified CME does not support the following:
  - CiscoWorks IP Telephony Environment Monitor (ITEM)
  - Element Management System (EMS) integration
  - Media Gateway Control Protocol (MGCP) on-net calls
  - Java Telephony Application Programming Interface (JTAPI) applications, such as the Cisco IP Softphone, Cisco Unified Communications Manager Auto Attendant, or Cisco Personal Assistant
  - Telephony Application Programming Interface (TAPI)
    Cisco Unified CME implements only a small subset of TAPI functionality. It supports operation of multiple independent clients (for example, one client per phone line), but not full support for

multiple-user or multiple-call handling, which is required for complex features such as automatic call distribution (ACD) and Cisco Unified Contact Center (formerly Cisco IPCC). Also, this TAPI version does not have direct media- and voice-handling capabilities.

# Information About Planning Your Configuration

Before configuring Cisco Unified CME, you should understand the following concepts:


- System Design, page 59
- Configuration Methods Summary, page 60
- Cisco Unified Communications Express - QCT, page 62
- Cisco Unified CME GUI, page 64
- Workflow, page 64


## System Design

Traditional telephony systems are based on physical connections and are therefore limited in the types of phone services that they can offer. Because phone configurations and directory numbers in a Cisco Unified CME system are software entities and because the audio stream is packet-based, an almost limitless number of combinations of phone numbers, lines, and phones can be planned and implemented.

Cisco Unified CME systems can be designed in many ways. The key is to determine the total number of simultaneous calls you want to handle at your site and at each phone at your site, and how many different directory numbers and phones you want to have. Even a Cisco Unified CME system has its limits, however. Consider the following factors in your system design:

- Maximum number of phones—This number corresponds to the maximum number of devices that can be attached. The maximum is platform- and version-dependent. To find the maximum for your platform and version, see the appropriate *Cisco CME Supported Firmware, Platforms, Memory, and Voice Products* document at http://www.cisco.com/en/US/products/sw/voicesw/ps4625/products_documentation_roadmap09186a0080189132.html.
- Maximum number of directory numbers—This number corresponds to the maximum number of simultaneous call connections that can occur. The maximum is platform- and version-dependent. To find the maximum for your platform and version, see the appropriate *Cisco CME Supported Firmware, Platforms, Memory, and Voice Products* document at http://www.cisco.com/en/US/products/sw/voicesw/ps4625/products_documentation_roadmap09186a0080189132.html.
- Telephone number scheme—Your numbering plan may restrict the range of telephone numbers or extension numbers that you can use. For example, if you have DID, the PSTN may assign you a certain series of numbers.
- Maximum number of buttons per phone—You may be limited by the number of buttons and phones that your site can use. For example, you may have two people with six-button phones to answer 20 different telephone numbers.

The flexibility of a Cisco Unified CME system is due largely to the different types of directory numbers (DNs) that you can assign to phones in your system. By understanding types of DNs and considering how they can be combined, you can create the complete call coverage that your business requires. For more information about DNs, see"Configuring Phones to Make Basic Calls" on page 165.

After setting up the DNs and phones that you need, you can add optional Cisco Unified CME features to create a telephony environment that enhances your business objectives. Cisco Unified CME systems are able to integrate with the PSTN and with your business requirements to allow you to continue using your existing number plans, dialing schemes, and call coverage patterns.

When creating number plans, dialing schemes, and call coverage patterns in Cisco Unified CME, there are several factors that you must consider:

- Is there an existing PBX or Key System that you are replacing and want to emulate?
- Number of phones and phone users to be supported?
- Do you want to use single-line or dual-line DNs?
- What protocols does your voice network support?
- Which call transfer and forwarding methods must be supported?
- What existing or preferred billing method do you want to use for transferred and forwarded calls?
- Do you need to optimize network bandwidth or minimize voice delay?

Because these factors can limit your choices for some of the configuration decisions that you will make when you create of a dialing plan, see the *Cisco Unified CME Solution Reference Network Design Guide* to help you understand the effect these factors have on your Cisco Unified CME implementation.

# Configuration Methods Summary

Your choice of configuration method depends on whether you want to create an initial configuration for your IP telephony system or you want to perform ongoing maintenance, such as routinely making additions and changes associated with employee turnover. Table 2 compares the different methods for configuring Cisco Unified CME:

***Table 2 Comparison of Configuration Methods for Cisco Unified CME***

| Configuration Method | Benefits | Restrictions |
|---|---|---|
| Cisco IOS command line interface<br><br>For information about supported features, see Table 7.<br><br>For information about using Cisco IOS commands, see the "Using Cisco IOS Commands to Create or Modify the Configuration" section on page 79. | • Generates commands for running configuration which can be saved on Cisco router to be configured.<br>• Use for setting up or modifying all parameters and features during initial configuration and ongoing maintenance. | Requires knowledge of Cisco IOS commands and Cisco Unified CME. |

*Table 2 Comparison of Configuration Methods for Cisco Unified CME (continued)*

| Configuration Method | Benefits | Restrictions |
|---|---|---|
| Cisco Unified Communications Express - QCT, page 62.<br>For information about using Cisco Unified Communications Express - QCT, see the "Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration" section on page 80. | • Configuration wizard-like GUI.<br>• Auto-discovers the hardware setup of the Cisco router.<br>• Accept default values to quickly configure a typical basic IP telephony system or modify preconfigured values, enter data, and choose options to customize the configuration.<br>• Generates commands for configuring an IP telephony system which can be uploaded to the Cisco router, along with the firmware files for all Cisco Unified IP phones to be connected to the Cisco router.<br>• Configuration can be saved as template to be reused for additional systems.<br>• Use for initial configuration including: basic information, such as VLANs, common DHCP pool, NTF servers, inbound and outbound destination numbers, and translation rules; and a subset of advanced features including paging, intercom, call park, hunt group, caller ID blocking, Class of Restriction, enabling video, and SIP truncking.<br>• Can import user configuration data (names and extension numbers) from an external file.<br>• Supports barcode-scanned input of MAC addresses and phone types. | • Factory-default configuration must be loaded in nonvolatile memory and in the running configuration of the Cisco router to be configured.<br>**Note** Cisco Unified Communications Express - QCT can reset the running configuration on a router to factory-default.<br>• Cannot be used to modify or maintain system configuration.<br>• Configures limited subset of advanced features. |
| Cisco Unified CME GUI, page 64.<br>For information about using the Cisco Unified CME GUI, see the "Using Cisco Unified CME GUI to Modify or Maintain Configuration" section on page 81. | • Graphical user interface<br>• Use for ongoing system maintenance<br>• Modifies, adds, and deletes phones and extensions; configures voice-mail; IP phone URLs; secondary dial tone pattern; timeouts; transfer patterns; and the music-on-hold file.<br>• Three configurable levels of access. | • Cannot provision voice features such as digit translation, call routing, and class of restriction.<br>• Cannot provision data features such as DHCP, IP addressing, and VLANs.<br>• Can only provision IP phones that are registered to Cisco Unified CME. Cannot use bulk administration to import multiple phones at the same time. Cannot manage IP phone firmware.<br>• Requires manual upgrade of files in flash if Cisco Unified CME version is upgraded. |

# Cisco Unified Communications Express - QCT

Cisco Unified Communications Express - QCT 3.0 and later versions is an optional web-based application provided by Cisco Systems to simplify installation of a new stand-alone Cisco IP Communications Express (Cisco IPC Express). Cisco IPC Express is a complete communications solution for the small office or enterprise branch office installed on a single Cisco router running Cisco IOS IP Voice or higher. Cisco IPC Express includes Cisco Unified Communications Manager Express (Cisco Unified CME) for call processing and peripheral services like Cisco Unity Express voice mail, Automated Attendant (AA), and support for IP-phone based XML and Telephony Application Programming Interface (TAPI) applications. Although Cisco IPC Express can support up to 240 phone users, this tool is intended for installing the typical configuration for 50 or fewer users, on a Cisco Integrated Services Router Voice Bundle.

Cisco QCT does not configure advanced features including but not limited to Cisco Unity Express customized scripts, overlay-dn, and advanced ACD (Automatic Call Distributor). You will be required to use Cisco IOS commands, Cisco Unity Express GUI or command line interface (CLI), and other Cisco configuration tools to configure advanced features after using Cisco QCT. After you fill in the required fields, Cisco Unified Communications Express - QCT generates the corresponding commands and uploads the basic telephony configuration to your Cisco router.

Cisco Unified Communications Express - QCT supports auto-discovery of installed hardware, so you can deploy an IP telephony configuration without having detailed knowledge of the modules installed in the router. Cisco Unified Communications Express - QCT prompts for common parameters needed to configure a Cisco Integrated Services router to support a complete IP telephony solution as a private-branch-exchange (PBX) with direct-inward-dial extensions or as a square mode key system.

Before using Cisco Unified Communications Express - QCT, the factory-default configuration must be loaded in nonvolatile memory and in the running configuration of the Cisco router to be configured. You can use Cisco Unified Communications Express - QCT to restore the factory default configuration on router to be configured.

After using Cisco Unified Communications Express - QCT, you can add any feature not supported by Cisco Unified Communications Express - QCT to the configuration by using Cisco IOS commands.

Cisco Unified Communications Express - QCT cannot be used to perform routine additions and changes associated with employee turnover. You can use the Cisco Unified CME GUI or Cisco IOS commands to modify the basic telephony configuration generated by Cisco Unified Communications Express - QCT.

For information about rapid deployment of a brand new stand-alone Cisco IPC Express system, see the "Workflow" section on page 64. For information about using Cisco Unified Communications - QCT, see the "Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration" section on page 80.

## Voice Bundles

Voice bundles include a Cisco Integrated Services Router for secure data routing, Cisco Unified CME software and licenses to support IP telephony, Cisco IOS SP Services or Advanced IP Services software for voice gateway features, and the flexibility to add Cisco Unity Express for voice mail and auto attendant capabilities. Voice bundles are designed to meet the diverse needs of businesses world wide. To complete the solution, add digital or analog trunk interfaces to interface to the PSTN or the host PBX, Cisco IP phones, and Cisco Catalyst data switches supporting Power-over Ethernet (PoE).

Table 3 contains a list of the Cisco tools for deploying Cisco IPC Express.

***Table 3 Cisco Tools for Deploying Cisco IPC Express***

| Tool Name | Description |
|---|---|
| Cisco Unified CME GUI, page 64 | Cisco Unified CME GUI enables the user to configure a subset of optional system and phone features. |
| Cisco Unified Communications Express - Quick Configuration Tool (QCT) | Cisco Unified Communications Express - QCT is a web-based tool for automatically creating and downloading valid configuration files utilizing user-supplied values and/or preconfigured default parameters.<br>This tool is the preferred method for configuring a new stand-alone Cisco IPC Express for 50 or fewer Cisco Unified CME users on a voice bundle. |
| Cisco IPC Express Quote-Builder | Cisco IPC Express Quote-Builder is an online application available to Cisco Systems partners to help them quickly identify recommended hardware configurations for Cisco IPC Express telephony systems based on the Cisco Integrated Services Router platform, which includes all versions of the Cisco 2800 and Cisco 3800 series routers. |
| Cisco Network Assistant | Cisco Network Assistant is a PC-based network management application optimized for networks of small and medium-sized businesses. Through a user-friendly GUI, the user can apply common services such as configuration management, inventory reports, password synchronization and Drag and Drop IOS Upgrade across Cisco SMB-Class switches, routers and access points. |
| Initialization Wizard for Cisco Unity Express<br>See "Configuring the System for the First Time," in the appropriate *Cisco Unity Express GUI Administrator Guide* at http://www.cisco.com/en/US/products/sw/voicesw/ps5520/products_documentation_roadmap09186a00803f3e19.html. | Initialization Wizard in the Cisco Unity Express GUI prompts the user for required information to configure users, voice mailboxes, and other features of voice mail and auto attendant. The wizard starts automatically the first time you log in to the Cisco Unity Express GUI. |
| Router and Security Device Manager (SDM) | Cisco Router and Security Device Manager (Cisco SDM) is an intuitive, Web-based device-management tool for Cisco routers. Cisco SDM simplifies router and security configuration through smart wizards, which help customers and Cisco partners quickly and easily deploy, and configure a Cisco router without requiring knowledge of the command-line interface (CLI).<br>Supported on Cisco 830 Series to Cisco 7301 routers, Cisco SDM is shipping on Cisco 1800 Series, Cisco 2800 Series, and Cisco 3800 Series routers pre-installed by the factory. |

# Cisco Unified CME GUI

The Cisco Unified CME GUI provides a web-based interface to manage most system-level and phone-level features. In particular, the GUI facilitates the routine additions and changes associated with employee turnover, allowing these changes to be performed by nontechnical staff.

The GUI provides three levels of access to support the following user classes:

- System administrator—Able to configure all systemwide and phone-based features. This person is familiar with Cisco IOS software and VoIP network configuration.
- Customer administrator—Able to perform routine phone additions and changes without having access to systemwide features. This person does not have to be familiar with Cisco IOS software.
- Phone user—Able to program a small set of features on his or her own phone and search the Cisco Unified CME directory.

The Cisco Unified CME GUI uses HTTP to transfer information between the Cisco Unified CME router and the PC of an administrator or phone user. The router must be configured as an HTTP server, and an initial system administrator username and password must be defined. Additional customer administrators and phone users can be added by using Cisco IOS command line interface or by using GUI screens.

Cisco Unified CME provides support for eXtensible Markup Language (XML) cascading style sheets (files with a .css suffix) that can be used to customize the browser GUI display.

The GUI supports authentication, authorization, and accounting (AAA) authentication for system administrators through a remote server capability. If authentication through the server fails, the local router is searched.

Cisco Unified CME GUI must be installed and set up before it can be used. Instructions for using the Cisco Unified GUI are in online help for the GUI.

For information about using the Cisco Unified CME GUI, see the "Using Cisco Unified CME GUI to Modify or Maintain Configuration" section on page 81.

# Workflow

This section contains the following topics:

- Configuring Cisco Unified CME: Workflow, page 64
- Using Cisco Unified Communications Express- QCT to Configure Cisco IPC Express: Workflow, page 68

## Configuring Cisco Unified CME: Workflow

Table 4 lists the tasks for installing and configuring Cisco Unified CME and for modifying the configuration, in the order in which the tasks are to be performed and including links to modules in this guide that support each task.

**Note** Not all tasks are required for all Cisco Unified CME systems, depending on software version and on whether it is a new Cisco Unified CME, an existing Cisco router that is being upgraded to support Cisco Unified CME, or an existing Cisco Unified CME that is being upgraded or modified for new features or to add or remove phones.

*Table 4 Workflow for Creating or Modifying Basic Telephony Configuration*

| Task | Cisco Unified CME Configuration | | Documentation |
|---|---|---|---|
| | New | Modify | |
| Install Cisco router and all recommended services hardware for Cisco Unified CME. | Required | Optional | Installing Hardware, page 70 |
| Download recommended Cisco IOS IP Voice or higher image to flash memory in the router. | Optional | Optional | Installing Cisco IOS Software, page 72 |
| Download recommended Cisco Unified CME software including phone firmware and GUI files. | Optional | Optional | Installing and Upgrading Cisco Unified CME Software, page 87 |
| Configure separate virtual LANs (VLANS) for data and voice on the port switch. | Required[1] | — | Using Network Assistant to Configure a Cisco Catalyst Switch, page 73 or<br>Using Cisco IOS Commands to Configure a Cisco Catalyst Switch, page 75 or<br>Configuring VLANs on an Internal Cisco Ethernet Switching Module, page 77 |
| • Enable calls in your VoIP network.<br>• Define DHCP.<br>• Set Network Time Protocol (NTP).<br>• Configure DTMF Relay for H.323 networks in multisite installations.<br>• Configure SIP trunk support.<br>• Change the TFTP address on a DHCP server<br>• Enable OOD-R. | Required[1] | Optional | Defining Network Parameters, page 109 |
| • Configure Bulk Registration.<br>• Set up Cisco Unified CME.<br>• Set date and time parameters.<br>• Block Automatic Registration.<br>• Define alternate location and type of configuration files.<br>• Change defaults for Time Outs.<br>• Configure a redundant router. | Required[1] | Optional | Configuring System-Level Parameters, page 137 |
| • Create directory numbers and assigning directory numbers to phones.<br>• Create phone configurations using Extension Assigner.<br>• Generate configuration files for phones.<br>• Reset or restart phones. | Required[1] | Optional | Configuring Phones to Make Basic Calls, page 165 |
| Connect to PSTN. | Required[1] | — | Configuring Dialing Plans, page 287 |

*Table 4 Workflow for Creating or Modifying Basic Telephony Configuration (continued)*

| Task | Cisco Unified CME Configuration | | Documentation |
|---|---|---|---|
| | New | Modify | |
| Install system- and user-defined files for localization of phones. | Optional[2] | Optional | Configuring Localization Support, page 307 |
| Enable call detail records (CDRs) for collecting accounting data. | Optional | Optional | *RADIUS VSA Voice Implementation Guide* |

1. Can be configured by using Cisco Unified Communications Express - QCT to generate a basic telephony configuration for Cisco Unified CME. For information, see the "Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration" section on page 80.
2. Required for certain Cisco Unified IP phones such as the Cisco Unified IP Phone 7911, 7941, 7961, 7970, and 7971. See documentation for more information.

Table 5 contains a list of tasks for adding commonly configured features in Cisco Unified CME and the module in which they appear in this guide. For a detailed list of features, with links to corresponding information in this guide, see "Cisco Unified CME Features Roadmap" on page 37.

*Table 5 Workflow for Adding Features in Cisco Unified CME*

| Task | Documentation |
|---|---|
| Configure transcoding to support conferencing, call transferring and forwarding, MoH, and Cisco Unity Express.[1] | Configuring Transcoding Resources, page 323 |
| Enable the graphical user interface in Cisco Unified CME.[1] | Enabling the GUI, page 359 |
| Configure support for voice mail.[1,2] | Integrating Voice Mail, page 375 |
| Configure interoperability with Cisco Unified CCX. | Configuring Interoperability with External Services, page 965 |
| Configure authentication support. | Configuring Security, page 409 |

*Table 5 Workflow for Adding Features in Cisco Unified CME (continued)*

| Task | Documentation |
|---|---|
| Add features.<br>**Note** Cisco Unified Communications Express - QCT can configure only a subset of features. You must use Cisco IOS commands to add other features.<br>• Call Blocking<br>• Call-Coverage Features, including:<br>– Call Hunt<br>– Call Pickup[1]<br>– Call Waiting<br>– Callback Busy Subscriber<br>– Hunt Groups[1]<br>– Night Service<br>– Overlaid Ephone-dns<br>• Call Park[1]<br>• Call Transfer and Forwarding<br>• Caller ID Blocking[1]<br>• Conferencing<br>• Intercom Lines[1]<br>• Music on Hold (MoH)<br>• Paging[1] | • Configuring Automatic Line Selection, page 479<br>• Configuring Call Blocking, page 485<br>• Configuring Call-Coverage Features, page 581<br>• Configuring Call Park, page 503<br>• Configuring Call Transfer and Forwarding, page 517<br>• Configuring Caller ID Blocking, page 657<br>• Configuring Conferencing, page 665<br>• Configuring Directory Services, page 707<br>• Configuring Do Not Disturb, page 727<br>• Configuring Extension Mobility, page 763<br>• Configuring Feature Access Codes, page 775<br>• Configuring Headset Auto-Answer, page 791<br>• Configuring Intercom Lines, page 799<br>• Configuring Loopback Call Routing, page 809<br>• Configuring Music on Hold, page 817<br>• Configuring Paging, page 831<br>• Configuring Presence Service, page 843<br>• Configuring Ring Tones, page 865<br>• Customizing Soft Keys, page 875<br>• Configuring Speed Dial, page 893 |
| Configure phone options, including:<br>• Customized Background Images for Cisco Unified IP Phone 7970<br>• Fixed Line/Feature Buttons for Cisco Unified IP Phone 7931G<br>• Header Bar Display<br>• PC Port Disable<br>• Phone Labels<br>• Programmable vendorConfig Parameters<br>• System Message Display<br>• URL Provisioning for Feature Buttons | Modifying Cisco Unified IP Phone Options, page 939 |
| Configure video support.[1] | Configuring Video Support for SCCP-Based Endpoints, page 913 |
| Configure Cisco Unified CME as SRST Fallback. | Configuring SRST Fallback Support, page 989 |

1. Can be configured by using Cisco Unified Communications Express - QCT to generate a basic telephony configuration for Cisco Unified CME. For information, see the "Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration" section on page 80.

2. Cisco Unified Communications Express - QCT configures support for Cisco Unity Express only. Support for integrating with other voice-mail systems must be configured by using Cisco IOS commands.

## Using Cisco Unified Communications Express- QCT to Configure Cisco IPC Express: Workflow

Table 6 lists the tasks for installing and configuring a brand new stand-alone Cisco IPC Express system, including Cisco Unified CME and Cisco Unity Express voice mail, in the suggested order in which the tasks are to be performed and including links to modules in this guide that support each task.

For information about modifying the configuration of an existing Cisco IPC Express system, see "Configuring Cisco Unified CME: Workflow" section on page 64.

***Table 6 Workflow for Using Cisco Unified Communications Express - QCT to Configure Cisco IPC Express***

| Task | Documentation |
|---|---|
| Install Cisco router and all recommended services hardware for Cisco Unified CME. | Installing Hardware, page 70 |
| Download recommended Cisco IOS IP Voice or higher image to flash memory in the router. | Installing Cisco IOS Software, page 72 |
| Download recommended Cisco Unified CME software including phone firmware and GUI files. | Installing and Upgrading Cisco Unified CME Software, page 87 |
| Use Cisco Unified Communications Express - QCT to generate and upload a basic telephony configuration for Cisco IPC Express. | Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration, page 80 |
| Install system- and user-defined files for localization of phones. | Configuring Localization Support, page 307 |
| Add features.<br>**Note** Cisco Unified Communications Express - QCT can configure only a subset of features. You must use Cisco IOS commands to add other features. | • Configuring Automatic Line Selection, page 479<br>• Configuring Call Blocking, page 485<br>• Configuring Call Transfer and Forwarding, page 517<br>• Configuring Conferencing, page 665<br>• Configuring Directory Services, page 707<br>• Configuring Do Not Disturb, page 727<br>• Configuring Extension Mobility, page 763<br>• Configuring Feature Access Codes, page 775<br>• Configuring Headset Auto-Answer, page 791<br>• Configuring Loopback Call Routing, page 809<br>• Configuring Music on Hold, page 817<br>• Configuring Presence Service, page 843<br>• Configuring Ring Tones, page 865<br>• Customizing Soft Keys, page 875<br>• Configuring Speed Dial, page 893 |
| Configure authentication support. | Configuring Security, page 409 |

*Table 6 Workflow for Using Cisco Unified Communications Express - QCT to Configure Cisco IPC Express*

| Task | Documentation |
|---|---|
| Configure conferencing features, including:<br>• Call hunt<br>• Call waiting<br>• Callback busy subscriber<br>• Night service<br>• Overlaid Ephone-dns | Configuring Conferencing, page 665 |
| Configure phone options, including:<br>• Customized Background Images for Cisco Unified IP Phone 7970<br>• Fixed Line/Feature Buttons for Cisco Unified IP Phone 7931G<br>• Header Bar Display<br>• PC Port Disable<br>• Phone Labels<br>• Programmable vendorConfig Parameters<br>• System Message Display<br>• URL Provisioning for Feature Buttons | Modifying Cisco Unified IP Phone Options, page 939 |
| Configure support for interoperability with Cisco Unified CCX. | Configuring Interoperability with External Services, page 965 |
| Configure Cisco Unified CME as fallback. | Configuring SRST Fallback Support, page 989 |

# How to Install Cisco Voice Services Hardware

**Note** Cisco routers are normally shipped with Cisco voice services hardware and other optional equipment that you ordered already installed. In the event that the hardware is not installed or you are upgrading your existing Cisco router to support Cisco Unified CME or Cisco Unity Express, you will be required to install hardware components.

Voice bundles do not include all the necessary components for Cisco Unity Express. Contact the Cisco IP Communications Express partner in your area for more information about including Cisco Unity Express in your configuration.

## Prerequisites

- Cisco router and all recommended hardware for Cisco Unified CME, and if required, Cisco Unity Express, is ordered and delivered, or is already onsite. To determine the recommended hardware configuration to support your telephony system requirements, see the Cisco IPC Express Quote-Builder online tool.

# Installing Hardware

To install the Cisco router and voice services hardware, perform the following steps.

## SUMMARY STEPS

1. Install the Cisco router on the network.
2. Connect to the Cisco router.
3. Use the **show version** or **show flash** command to check the amount of memory installed in the router.
4. Identify DRAM and flash memory requirements.
5. Install or upgrade system memory.
6. Install Cisco voice services hardware.
7. Disable Smartinit and allocate ten percent of the total memory to Input/Output (I/O) memory.

## DETAILED STEPS

**Step 1** Install the Cisco router on your network. To find installation instructions for the Cisco router, access documents located at www.cisco.com>Technical Support & Documentation>Product Support>Routers>*router you are using*>Install and Upgrade Guides.

**Step 2** Install Cisco voice services hardware.

a. To find installation instructions for any Cisco interface card, access documents located at www.cisco.com>Technical Support & Documentation>Product Support>Cisco Interfaces and Modules>*interface you are using*>Install and Upgrade Guides or Documentation Roadmap.

b. To install and configure your Catalyst switch, see Cisco Network Assistant.

c. To find installation instructions for any Cisco EtherSwitch module, access documents located at www.cisco.com>Technical Support & Documentation>Product Support>Cisco Switches>*switch you are using*>Install and Upgrade Guides.

**Step 3** Connect to the Cisco router using a terminal or PC with terminal emulation.

Attach a terminal or PC running terminal emulation to the console port of the router. For more information on cabling, and details about how to connect a terminal to the console port or the AUX port, see *Cabling Guide for Console and Aux Ports on Cisco Routers*.

Use the following terminal settings:

- 9600 baud rate
- No parity
- 8 data bits
- 1 stop bit
- No flow control

**Note** Memory recommendations and maximum numbers of Cisco IP phones identified in the next step are for common Cisco Unified CME configurations only. Systems with large numbers of phones and complex configurations may not work on all platforms and can require additional memory or a higher performance platform.

**Step 4** Log in to the router and use the **show version** EXEC command or the **show flash** privileged EXEC command to check the amount of memory installed in the router. Look for the following lines after issuing the s**how version** command.

**Example**:

```
Router> show version
...
 Cisco 2691 (R7000) processor (revision 0.1) with 177152K/19456K bytes of memory
...
 31360K bytes of ATA System Compactflash (Read/Write)
```

The first line indicates how much Dynamic RAM (DRAM) and Packet memory is installed in your router. Some platforms use a fraction of their DRAM as Packet memory. The memory requirements take this into account, so you have to add both numbers to find the amount of DRAM available on your router (from a memory requirement point of view).

The second line identifies the amount of flash memory installed in your router.

or

Look for the following line after issuing the **show flash** command. Add the number available to the number used to determine the total flash memory installed in the Cisco router.

**Example**:

```
Router# show flash
...
 2252800 bytes available, (29679616 bytes used]
```

**Step 5** Identify DRAM and flash memory requirements for the Cisco Unified CME version and Cisco router model you are using. To find Cisco Unified CME specifications, see the *Cisco Unified CME Supported Firmware, Platforms, Memory, and Voice Products* for the Cisco Unified CME version you are using at: http://www.cisco.com/en/US/products/sw/voicesw/ps4625/products_documentation_roadmap09186a0080189132.html

**Step 6** Compare the amount of memory required to the amount of memory installed in the router. To install or upgrade the system memory in the router, access documents located at www.cisco.com>Technical Support & Documentation>Product Support>Routers>*router you are using*>Install and Upgrade Guides.

**Step 7** Use the **memory-size iomem** *i/o memory-percentage* privileged EXEC command to disable Smartinit and allocate ten percent of the total memory to Input/Output (I/O) memory.

**Example**:

```
Router# memory-size iomem 10
```

# How to Install Cisco IOS Software

**Note** The Cisco router in a voice bundle is preloaded with the recommended Cisco IOS software release and feature set plus the necessary Cisco Unified CME phone firmware and GUI files to support Cisco Unified CME and Cisco Unity Express. If the recommended software is not installed or if you are upgrading an existing Cisco router to support Cisco Unified CME and Cisco Unity Express, you will be required to download and extract the required image and files.

## Prerequisites

- The Cisco router is installed including sufficient memory, all Cisco voice services hardware, and other optional hardware.

## Installing Cisco IOS Software

To verify that the recommended software is installed on the Cisco router and if required, download and install a Cisco IOS Voice or higher image, perform the following steps.

### SUMMARY STEPS

1. Identify which Cisco IOS software release is installed on router.
2. Determine whether the Cisco IOS release supports the recommended Cisco Unified CME.
3. Download and extract the recommended Cisco IOS IP Voice or higher image to flash memory
4. Use the **reload** command to reload the Cisco Unified CME router with the new software.

### DETAILED STEPS

**Step 1** Identify which Cisco IOS software release is installed on router. Log in to the router and use the **show version EXEC** command.

**Example**:

```
Router> show version
Cisco Internetwork Operating System Software
IOS (tm) 12.3 T Software (C2600-I-MZ), Version 12.3(11)T, RELEASE SOFTWARE
```

**Step 2** Compare the Cisco IOS release installed on the Cisco router to the information in the *Cisco Unified CME and Cisco IOS Version Matrix* to determine whether the Cisco IOS release supports the recommended Cisco Unified CME.

**Step 3** To download and extract the recommended Cisco IOS IP Voice or higher image to flash memory in the router. See *Copying Images from a Network Server to flash Memory*.

To find software installation information, access information located at www.cisco.com>Technical Support & Documentation>Product Support> Cisco IOS Software>*Cisco IOS Software Mainline release you are using*> Configuration Guides> Cisco IOS Configuration Fundamentals and Network Management Configuration Guide>Part 2: File Management>Locating and Maintaining System Images.

**Step 4** To reload the Cisco Unified CME router with the new software after replacing or upgrading the Cisco IOS release, use the **reload** privileged EXEC command.

**Example**:

```
Router# reload

 System configuration has been modified. Save [yes/no]:
 Y
 Building configuration...
 OK
 Proceed with reload? Confirm.
 11w2d: %Sys-5-RELOAD: Reload requested by console. Reload reason: reload command
 .
 System bootstrap, System Version 12.2(8r)T, RELEASE SOFTWARE (fc1)
...
Press RETURN to get started.
...
Router>
```

## What to Do Next

- If you installed a new Cisco IOS software release on the Cisco router, download and extract the compatible Cisco Unified CME version. See the "Installing Cisco Unified CME Software" section on page 92.
- If you want to use Cisco Unified Communications Express - QCT to generate and upload a basic telephony configuration, see the "Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration" section on page 80.
- If you are installing a new stand-alone Cisco Unified CME system and you are *not* using Cisco Unified Communications Express - QCT to generate and upload a basic telephony configuration, see the "How to Configure VLANs on a Cisco Switch" section on page 73.

# How to Configure VLANs on a Cisco Switch

**Note** If you used or are using Cisco Unified Communications express - QCT to configure Cisco Unified CME or a Cisco IPC Express system, skip this task and see "Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration" section on page 80.

To configure two Virtual Local Area Networks (VLANs), one for voice and one for data, on a Cisco Catalyst switch or an internal Cisco NM, HWIC, or Fast Ethernet switching module, perform only *one* of the following tasks.

- Using Network Assistant to Configure a Cisco Catalyst Switch, page 73
- Using Cisco IOS Commands to Configure a Cisco Catalyst Switch, page 75
- Configuring VLANs on an Internal Cisco Ethernet Switching Module, page 77

# Using Network Assistant to Configure a Cisco Catalyst Switch

To configure two Virtual Local Area Networks (VLANs), one for voice and one for data, on an external Cisco Catalyst switch and to implement Cisco Quality-of-Service (QoS) policies on your network, perform the following steps.

## Prerequisites

- The Cisco router is installed including sufficient memory, all Cisco voice services hardware and other optional hardware.
- The recommended Cisco IOS release and feature set plus the necessary Cisco Unified CME phone firmware and GUI files are installed.
- Determine if you can use the Cisco Network Assistant to configure VLANs on the switch for your Cisco Unified CME router, see "Devices Supported" in the appropriate *Release Notes for Cisco Network Assistant* at: http://www.cisco.com/en/US/products/ps5931/prod_release_notes_list.html.

**Note** A PC connected to the Cisco Unified CME router over the LAN is required to download, install, and run Cisco Network Assistant.

- If you want to use Cisco Network Assistant to configure VLANs on the Cisco Catalyst switch, verify that the PC on which you want to install and run Cisco Network Assistant meets the minimum hardware and operating system requirements. See "Installing, Launching, and Connecting Network Assistant" in *Getting Started with Cisco Network Assistant.*
- An RJ-45-to-RJ-45 rollover cable and the appropriate adapter (both supplied with the switch) connecting the RJ-45 console port of the switch to a management station or modem is required to manage a Cisco Catalyst switch through the management console.

  For more information on cabling and details about how to connect a management station or modem to the console port, see "Connecting to the Console Port" at: http://cisco.com/en/US/products/hw/switches/ps597/products_installation_and_configuration_guide_chapter09186a008007ef5f.html#xtocid14.

### SUMMARY STEPS

1. Install, launch, and connect Cisco Network Assistant.
2. Use Network assistant to enable two VLANs on the switch port, configure a trunk between the Cisco Unified CME router and the switch, and configure Cisco IOS Quality-of-Service (QoS).

### DETAILED STEPS

**Step 1** Install, launch, and connect Cisco Network Assistant. For instructions, see "Installing, Launching, and Connecting Network Assistant" in *Getting Started with Cisco Network Assistant.*

**Step 2** Use Cisco Network Assistant to perform the following tasks. See online Help for additional information and procedures.

- Enable two VLANs on the switch port.
- Configure a trunk between the Cisco Unified CME router and the switch.
- Configure Cisco IOS Quality-of-Service (QoS).

## What to Do Next

See the "Using Cisco IOS Commands to Create or Modify the Configuration" section on page 79.

# Using Cisco IOS Commands to Configure a Cisco Catalyst Switch

To configure two Virtual Local Area Networks (VLANs), one for voice and one for data, a trunk between the Cisco Unified CME router and the switch, and Cisco IOS Quality-of-Service (QoS) on an external Cisco Catalyst switch, perform the following steps.

## Prerequisites

- The Cisco router is installed including sufficient memory, all Cisco voice services hardware and other optional hardware.
- The recommended Cisco IOS release and feature set plus the necessary Cisco Unified CME phone firmware and GUI file are installed.
- An RJ-45-to-RJ-45 rollover cable and the appropriate adapter (both supplied with the switch) connecting the RJ-45 console port of the switch to a management station or modem is required to manage a Cisco Catalyst switch through the management console.

  For more information on cabling and details about how to connect a management station or modem to the console port, see "Connecting to the Console Port" at: http://cisco.com/en/US/products/hw/switches/ps597/products_installation_and_configuration_guide_chapter09186a008007ef5f.html#xtocid14.

### SUMMARY STEPS

1. **enable**
2. **vlan database**
3. **vlan** *vlan-number* **name** *vlan-name*
4. **vlan** *vlan-number* **name** *vlan-name*
5. **exit**
6. **wr**
7. **configure terminal**
8. **macro global apply cisco-global**
9. **interface** *slot-number/port-number*
10. **macro apply cisco-phone $AVID** *number* **$VVID** *number*
11. **interface** *slot-number/port-number*
12. **macro apply cisco-router $NVID** *number*
13. **end**
14. **wr**

## DETAILED STEPS

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br><br>**Example:**<br>`Switch> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **vlan database**<br><br>**Example:**<br>`Switch# vlan database` | Enters VLAN configuration mode. |
| **Step 3** | **vlan** *vlan-number* **name** *vlan-name*<br><br>**Example:**<br>`Switch(vlan)# vlan 10 name data`<br>`VLAN 10 modified`<br>`Name: DATA` | Specifies the number and name of the VLAN being configured.<br>• *vlan-number*—Unique value that you assign to the dial-peer being configured. Range: 2 to 1004.<br>• *name*—Name of the VLAN to associate to the vlan-number being configured. |
| **Step 4** | **vlan** *vlan-number* **name** *vlan-name*<br><br>**Example:**<br>`Switch(vlan)# vlan 100 name voice`<br>`VLAN 100 modified`<br>`Name: VOICE` | Specifies the number and name of the VLAN being configured. |
| **Step 5** | **exit**<br><br>**Example:**<br>`Switch(vlan)# exit` | Exits this configuration mode. |
| **Step 6** | **wr**<br><br>**Example:**<br>`Switch# wr` | Writes the modifications to the configuration file. |
| **Step 7** | **configure terminal**<br><br>**Example:**<br>`Switch# configure terminal` | Enters global configuration mode. |
| **Step 8** | **macro global apply cisco-global**<br><br>**Example:**<br>`Switch (config)# macro global apply cisco-global` | Applies the Smartports global configuration macro for QoS. |
| **Step 9** | **interface** *slot-number/port-number*<br><br>**Example:**<br>`Switch (config)# interface fastEthernet 0/1` | Specifies interface to be configured while in the interface configuration mode.<br>• *slot-number/port-number*—Slot and port of interface to which Cisco IP phones or PCs are connected.<br>**Note** The slash must be entered between the slot and port numbers. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 10** | **macro apply cisco-phone $AVID** *number* **$VVID** *number*<br><br>**Example:**<br>`Switch (config-if)# macro apply cisco-phone $AVID 10 $VVID 100` | Applies VLAN and QoS settings in Smartports macro to the port being configured.<br>• **$AVID** *number*—Data VLAN configured in earlier step.<br>• **$VVID** *number*—Voice VLAN configured in earlier step. |
| **Step 11** | **interface** *slot-number/port-number*<br><br>**Example:**<br>`Switch (config-if)# interface fastEthernet 0/24` | Specifies interface to be configured while in the interface configuration mode.<br>• *slot-number*/*port-number*—Slot and port of interface to which the Cisco router is connected.<br>**Note** The slash must be entered between the slot and port numbers. |
| **Step 12** | **macro apply cisco-router $NVID** *number*<br><br>**Example:**<br>`Switch (config-if)# macro apply cisco-router $NVID 10` | Applies the VLAN and QoS settings in Smartports macro to the port being configured.<br>• **$NVID** *number*—Data VLAN configured in earlier step. |
| **Step 13** | **end**<br><br>**Example:**<br>`Switch(config-if)# end` | Exits to privileged EXEC configuration mode. |
| **Step 14** | **wr**<br><br>**Example:**<br>`Switch# wr` | Writes the modifications to the configuration file. |

## What to Do Next

See the "Using Cisco IOS Commands to Create or Modify the Configuration" section on page 79.

# Configuring VLANs on an Internal Cisco Ethernet Switching Module

To configure two Virtual Local Area Networks (VLANs), one for voice and one for data, on an internal Cisco Ethernet switching module, perform the following steps.

## Prerequisites

- The Cisco router is installed including sufficient memory, all Cisco voice services hardware and other optional hardware.
- The recommended Cisco IOS release and feature set plus the necessary Cisco Unified CME phone firmware and GUI files are installed.
- The switch is in privileged EXEC mode.

### SUMMARY STEPS

1. **enable**
2. **vlan database**
3. **vlan** *vlan-number* **name** *vlan-name*
4. **vlan** *vlan-number* **name** *vlan-name*
5. **exit**
6. **wr**

### DETAILED STEPS

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br><br>**Example:**<br>`Switch> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **vlan database**<br><br>**Example:**<br>`Switch# vlan database` | Enters VLAN configuration mode. |
| **Step 3** | **vlan** *vlan-number* **name** *vlan-name*<br><br>**Example:**<br>`Switch(vlan)# vlan 10 name data`<br>`VLAN 10 modified`<br>`Name: DATA` | Specifies the number and name of the VLAN being configured.<br>• *vlan-number*—Unique value that you assign to dial-peer being configured. Range: 2 to 1004.<br>• *name*—Name of the VLAN to associate to the vlan-number being configured. |
| **Step 4** | **vlan** *vlan-number* **name** *vlan-name*<br><br>**Example:**<br>`Switch(vlan)# vlan 100 name voice`<br>`VLAN 100 modified`<br>`Name: VOICE` | Specifies the number and name of the VLAN being configured. |
| **Step 5** | **exit**<br><br>**Example:**<br>`Switch(vlan)# exit` | Exits this configuration mode. |
| **Step 6** | **wr**<br><br>**Example:**<br>`Switch# wr` | Writes the modifications to the configuration file. |

## What to Do Next

See the "Using Cisco IOS Commands to Create or Modify the Configuration" section on page 79.

# How to Configure Cisco Unified CME

This section contains the following tasks:


- Using Cisco IOS Commands to Create or Modify the Configuration, page 79
- Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration, page 80
- Using Cisco Unified CME GUI to Modify or Maintain Configuration, page 81


## Using Cisco IOS Commands to Create or Modify the Configuration

**Note** For information about the Cisco IOS Command-Line Interface (CLI) and command modes, see Using Cisco IOS Software.

### Prerequisites

- Hardware and software to establish a physical or virtual console connection to the Cisco router using a terminal or PC running terminal emulation is available and operational.
- To establish a physical console connection, attach a terminal or PC running terminal emulation to the console port of the router. For more information on cabling, and details about how to connect a terminal to the console port or the AUX port, see Cabling Guide for Console and Aux Ports on Cisco Routers.

  For connecting to the router to be configured, use the following terminal settings:
  - 9600 baud rate
  - No parity
  - 8 data bits
  - 1 stop bit
  - No flow control
- We recommend that you complete the worksheets to gather required site-specific information for the Cisco router to be configured. See the worksheet set at http://www.cisco.com/en/US/products/sw/voicesw/ps4625/prod_configuration_guide09186a008075920 1.html#wp1007671.

**Note** Even though the worksheet set is for configuring a Typical (recommended) installation of an IP telephony system using Cisco Unified Communications Express - QCT, the information is required to create an initial configuration using any of the configuration methods.

### What to Do Next

For step-by-step procedures for configuring Cisco Unified CME using Cisco IOS commands, see the *Cisco Unified CME System Administrator Guide*.

# Using Cisco Unified Communications Express - QCT to Generate a Telephony Configuration

To u se Cisco Unified Communications Express - QCT to generate a basic telephony configuration for a PBX or Square Mode (key system) system, with or without Cisco Unity Express, or to reset the configuration of a Cisco router to factory default, see the *Cisco Unified Communications Express - QCT User Guide*.

## Prerequisites

- Your IP network is operational and you can access Cisco web.
- A PC with Microsoft® Internet Explorer 5.5 or a later version is connected, using a serial cable, to the console port of Cisco router to be configured. If you need assistance in connecting your PC to your router's console port, refer to the Install and Upgrade Guide for the Cisco router.
- The Block Pop-up Windows feature for Microsoft® Internet Explorer must be disabled.
- You must be a member of Administrators group under User Account settings for your PC.
- You must have a valid Cisco CCO account.
- The factory-default configuration is loaded in nonvolatile memory and in the running configuration of the Cisco router to be configured.

**Note** Cisco Unified Communications Express - QCT can be used to restore the factory default configuration on router to be configured.

- If you are using Cisco Unified Communications Express - QCT to upload firmware files for Cisco Unified IP phones after uploading the generated configuration, all Cisco firmware files to be uploaded must be installed in the folder named Phoneloads, within the local folder in which Cisco Unified Communications Express - QCT is installed.
- *Worksheets for Cisco Unified Communications Express - QCT* are complete with required site-specific information for the Cisco router to be configured.

## Restrictions

- Cisco Unified Communications Express - QCT cannot be used to perform routine additions and changes associated with employee turnover.
- Cisco Unified Communications Express - QCT can configure only a subset of features of Cisco Unified CME and generate the basic telephony configuration.

## What to Do Next

After using Cisco Unified Communications Express - QCT to generate a basic telephony configuration, you can skip the following modules in the *Cisco Unified CME System Administrator Guide* when you use Cisco IOS commands to add features to the initial configuration:

- Defining Network Parameters
- Configuring System-Level Parameters
- Configuring Phones to Make Basic Calls

- Creating Phone Configurations Using Extension Assigner
- Configuring Dialing Plans
- Adding Features, but only for the following:
  - Configuring Call Blocking
  - Configuring Call Park
  - Configuring Call Transfer and Forwarding
  - Configuring Call-Coverage Features
  - Configuring Caller ID Blocking
  - Configuring Conferencing
  - Configuring Intercom Lines
  - Configuring Music on Hold
  - Configuring Paging
- Enabling the GUI
- Configuring Voice-Mail Support (for Cisco Unity Express only). To add support Cisco Unity or other voice-mail systems, you must use Cisco IOS commands to modify the configuration.

# Using Cisco Unified CME GUI to Modify or Maintain Configuration

To use the Cisco Unified CME GUI to modify the configuration, see online help.

## Prerequisites

- Cisco CME 3.2 or a later version.
- Files required for the operation of the GUI must be copied into flash memory on the router. For information about files, see "Installing and Upgrading Cisco Unified CME Software" on page 87.
- Cisco Unified CME GUI must be enabled. For information, see "Enabling the GUI" on page 359.

## Restrictions

- The web browser that you use to access the GUI must be Microsoft Internet Explorer 5.5 or a later version. No other type of browser can be used to access the GUI.
- Cannot provision voice features such as digit translation, call routing, and class of restriction.
- Cannot provision data features such as DHCP, IP addressing, and VLANs.
- Can only provision IP phones that are registered to Cisco Unified CME. Cannot use bulk administration to import multiple phones at the same time. Cannot manage IP phone firmware.
- Requires manual upgrade of files in flash memory of router if Cisco Unified CME is upgraded to later version.
- Other minor limitations, such as:
  - If you use an XML configuration file to create a customer administrator login, the size of that XML file must be 4000 bytes or smaller.

- The password of the system administrator cannot be changed through the GUI. Only the password of a customer administrator or a phone user can be changed through the GUI.
- If more than 100 phones are configured, choosing to display all phones will result in a long delay before results are shown.

# Additional References

The following sections provide references related to Cisco Unified CME features.

## Related Documents

| Related Topic | Document Title |
|---|---|
| Cisco Unified CME configuration | • *Cisco Unified CME Command Reference*<br>• *Cisco Unified CME Documentation Roadmap* |
| Cisco IOS commands | • *Cisco IOS Voice Command Reference*<br>• *Cisco IOS Software Releases 12.4T Command References* |
| Cisco IOS configuration | • *Cisco IOS Voice Configuration Library*<br>• *Cisco IOS Software Releases 12.4T Configuration Guides* |
| Phone documentation for Cisco Unified CME | • Quick Reference Cards<br>• User Guides |

## Technical Assistance

| Description | Link |
|---|---|
| The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register on Cisco.com. | http://www.cisco.com/techsupport |

# Feature Summary

Table 7 contains a list of commonly configured features in Cisco Unified CME and the module in which they appear in this guide. For a detailed list of features, with links to corresponding information in this guide, see "Cisco Unified CME Features Roadmap" on page 37.

***Table 7 Parameters and Features Supported by Cisco IOS Commands***

| Parameters and Features | Where to Find Configuration Information |
|---|---|
| **Cisco Unified CME Software** | |
| Installing and upgrading software, including:<br>• Cisco Unified CME<br>• Cisco Unified CME GUI<br>• Firmware files for Cisco Unified IP phones | Installing and Upgrading Cisco Unified CME Software |
| **Basic Configuration** | |
| • Enabling Calls in Your VoIP Network<br>• Defining DHCP<br>• Setting Network Time Protocol<br>• Configuring DTMF Relay for H.323 Networks in Multisite Installations<br>• Configuring SIP Trunk Support<br>• Changing the TFTP Address on a DHCP Server<br>• Enabling OOD-R | Defining Network Parameters |
| • Configuring Bulk Registration<br>• Setting Up Cisco Unified CME<br>• Setting Date and Time Parameters<br>• Blocking Automatic Registration<br>• Defining Alternate Location and Type of Configuration Files<br>• Changing Defaults for Time Outs<br>• Configuring a Redundant Router | Configuring System-Level Parameters |
| • Creating Directory Numbers, Assigning Directory Numbers to Phones<br>• Creating Phone Configurations Using Extension Assigner<br>• Generating Configuration Files for Phones<br>• Resetting and Restarting Phones | Configuring Phones to Make Basic Calls |
| **Connecting to PSTN** | |
| • Dial-plan patterns<br>• Translation rules and profiles<br>• Secondary dial tones | Configuring Dialing Plans |

*Table 7 Parameters and Features Supported by Cisco IOS Commands*

| Parameters and Features | Where to Find Configuration Information |
|---|---|
| **Transcoding Support** | |
| • DSP farms<br>• NMs or NM farms<br>• Transcoding sessions | Configuring Transcoding Resources. |
| **Localization Support** | |
| • Use locale<br>• Network locale | Configuring Localization Support. |
| **Cisco Unified CME GUI** | Enabling the GUI |
| **Features** | |
| • Automatic line selection<br>• Call blocking<br>• Call park<br>• Call transfer and forwarding<br>• Caller ID blocking<br>• Conferencing<br>• Directory services<br>• Do Not Disturb (DND)<br>• Feature Access Codes (FAC)<br>• Headset auto-answer<br>• Intercom lines<br>• Loopback call routing<br>• Music on Hold (MOH)<br>• Paging<br>• Presence service<br>• Ring tones<br>• Soft keys<br>• Speed dial | Adding Features |
| • Call hunt<br>• Call pickup<br>• Call waiting<br>• Callback busy subscriber<br>• Hunt groups<br>• Night service<br>• Overlaid Ephone-dns | Configuring Call-Coverage Features. |

*Table 7 Parameters and Features Supported by Cisco IOS Commands*

| Parameters and Features | Where to Find Configuration Information |
|---|---|
| **Authentication Support** | |
| • Phone authentication startup messages<br>• CTL file<br>• CTL client and provider<br>• MIC root certificate | Configuring Security. |
| **Phone Options** | |
| • Customized Background Images for Cisco Unified IP Phone 7970<br>• Fixed Line/Feature Buttons for Cisco Unified IP Phone 7931G<br>• Header Bar Display<br>• PC Port Disable<br>• Phone Labels<br>• Programmable vendorConfig Parameters<br>• System Message Display<br>• URL Provisioning for Feature Buttons | Modifying Cisco Unified IP Phone Options. |
| **Video Support** | Configuring Video Support for SCCP-Based Endpoints |
| **Voice-Mail Support** | |
| • Cisco Unity Connection<br>• Cisco Unity Express<br>• Cisco Unity<br>• DTMF integration for legacy voice-mail applications<br>• Mailbox selection policy<br>• RFC 2833 Dual Tone Multifrequency (DTMF) MTP Passthrough<br>• MWI | Integrating Voice Mail. |
| **Cisco Unified CME as SRST fallback** | Configuring SRST Fallback Support. |