Cisco Unified IP Phone 6921, 6941, and 6961 Administration Guide for Cisco Unified Communications Manager 8.0 (SCCP)

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Preface

Overview

Cisco Unified IP Phone 6921, 6941, and 6961 Administration Guide for Cisco Unified Communications Manager 8.0 (SCCP) provides the information you need to understand, install, configure, manage, and troubleshoot the phones on a Voice-over-IP (VoIP) network.

Because of the complexity of an IP telephony network, this guide does not provide complete and detailed information for procedures that you need to perform in Cisco Unified Communications Manager (Cisco Unified CM) or other network devices. See the "Obtaining Documentation, Obtaining Support, and Security Guidelines" section on page xiii.

Audience

Network engineers, system administrators, or telecom engineers should review this guide to learn the steps required to properly set up the Cisco Unified IP Phone on the network.

The tasks described are administration-level tasks and are not intended for end-users of the phones. Many of the tasks involve configuring network settings and affect the phone's ability to function in the network.

Because of the close interaction between the Cisco Unified IP Phone and Cisco Unified CM, many of the tasks in this manual require familiarity with Cisco Unified CM.

Organization

This manual is organized as follows.

Chapter	Description
Chapter 1, "An Overview of the Cisco Unified IP Phone"	Provides a conceptual overview and description of the Cisco Unified IP Phone.
Chapter 2, "Preparing to Install the Cisco Unified IP Phone on Your Network"	Describes how the Cisco Unified IP Phone interacts with other key IP telephony components, and provides an overview of the tasks required prior to installation.
Chapter 3, "Setting Up the Cisco Unified IP Phone"	Describes how to install and configure the Cisco Unified IP Phone on your network properly and safely.

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Chapter 4, "Configuring Settings on the Cisco Unified IP Phone"	Describes how to configure network settings, verify status, and make global changes to the Cisco Unified IP Phone.
Chapter 5, "Configuring Features, Templates, Services, and Users"	Provides an overview of procedures for configuring telephony features, configuring directories, configuring phone button and softkey templates, setting up services, and adding users to Cisco Unified Communications Manager.
Chapter 6, "Customizing the Cisco Unified IP Phone"	Explains how to customize phone ring sounds and the phone idle display at your site.
Chapter 7, "Viewing Model Information, Status, and Statistics on the Cisco Unified IP Phone"	Explains how to view model information, status messages, network statistics, and firmware information from the Cisco Unified IP Phone.
Chapter 8, "Monitoring the Cisco Unified IP Phone Remotely"	Describes the information that you can obtain from the phone's web page to remotely monitor the operation of a phone and to assist with troubleshooting.
Chapter 9, "Troubleshooting and Maintenance"	Provides tips for troubleshooting the Cisco Unified IP Phone and the Cisco Unified IP Phone Expansion Modules.
Appendix A, "Providing Information to Users Via a Website"	Provides suggestions for setting up a website for providing users with important information about their Cisco Unified IP Phones.
Appendix B, "Supporting International Users"	Provides information about setting up phones in non–English environments.
Appendix C, "Technical Specifications"	Provides technical specifications of the Cisco Unified IP Phone.
Appendix D, "Basic Phone Administration Steps"	Provides procedures for basic administration tasks such as adding a user and phone to Cisco Unified CM and then associating the user to the phone.
Appendix E, "Installing the Wall Mount Kit for the Cisco Unified IP Phones 6921, 6941, and 6961"	Contains instructions for installing the wall mount for the Cisco Unified IP Phone.
Appendix F, "Cisco Unified IP Phone Non-Lockable Wall Mount"	Contains instructions for installing the Cisco Unified IP Phone Non-Lockable Wall Mount

Related Documentation

For more information about Cisco Unified IP Phones or Cisco Unified CM, refer to the following publications.

Cisco Unified IP Phone 6900 Series

These publications are available at the following URL:

http://www.cisco.com/en/US/products/ps10326/tsd_products_support_series_home.html

- *Cisco Unified IP Phone 6921, 6941, and 6961 User Guide for Cisco Unified Communications Manager 8.0 (SCCP)*
- *Quick Start Guide for the Cisco Unified IP Phone 6921*
- *Quick Start Guide for the Cisco Unified IP Phone 6941 for Administrative Assistants*
- *Regulatory Compliance and Safety Information for Cisco Unified IP Phones*

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Cisco Unified Communications Manager Administration

Related publications are available at the following URL:

http://www.cisco.com/en/US/products/sw/voicesw/ps556/tsd_products_support_series_home.html

Cisco Unified Communications Manager Business Edition

Related publications are available at the following URL:

http://www.cisco.com/en/US/products/ps7273/tsd_products_support_series_home.html

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly What's New in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Cisco Product Security Overview

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

Further information regarding U.S. export regulations may be found at http://www.access.gpo.gov/bis/ear/ear_data.html.

Document Conventions

This document uses the following conventions:

Convention	Description
boldface font	Commands and keywords are in **boldface**.
italic font	Arguments for which you supply values are in *italics*.
[ ]	Elements in square brackets are optional.
{ x	y	z }	Alternative keywords are grouped in braces and separated by vertical bars.
[x	y	z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
`screen` font	Terminal sessions and information the system displays are in `screen` font.

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Convention	Description
`boldface screen` font	Information you must enter is in `boldface screen` font.
italic screen font	Arguments for which you supply values are in *italic screen* font.
^	The symbol ^ represents the key labeled Control—for example, the key combination ^D in a screen display means hold down the Control key while you press the D key.
< >	Nonprinting characters, such as passwords are in angle brackets.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Warnings use the following convention:

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

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C H A P T E R 1

An Overview of the Cisco Unified IP Phone

The Cisco Unified IP Phones 6921, 6941, and 6961 provide voice communication over an IP network. The Cisco Unified IP Phone functions much like a digital business phone, allowing you to place and receive phone calls and to access features such as mute, hold, transfer, speed dial, call forward, and more. In addition, because the phone is connected to your data network, it offers enhanced IP telephony features, including access to network information and services, and customizeable features and services.

A Cisco Unified IP Phone, like other network devices, must be configured and managed. These phones encode G.711a, G.711μ, G.729, G.729a, G.729ab, and decode G.711a, G.711μ, G.729, G.729a, and G.729ab.

This chapter includes the following topics:

- Understanding the Cisco Unified IP Phones 6921, 6941, and 6921, page 1-2
- What Networking Protocols are Used?, page 1-9
- What Features are Supported on the Cisco Unified IP Phone 6921, 6941, and 6961?, page 1-12
- Overview of Configuring and Installing Cisco Unified IP Phones, page 1-22
- Terminology Differences, page 1-28

⚠️ **Caution** Using a cell, mobile, or GSM phone, or two-way radio in close proximity to a Cisco Unified IP Phone may cause interference. For more information, refer to the manufacturer's documentation of the interfering device.

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Understanding the Cisco Unified IP Phones 6921, 6941, and 6921

Figure 1-1 shows the main components of the Cisco Unified IP Phone 6921.

Figure 1-1   *Cisco Unified IP Phone 6921*

Table 1-1 describes the buttons on the Cisco Unified IP Phone 6921.

Table 1-1   *Features on the Cisco Unified IP Phone 6921*

1	Handset light strip	Indicates an incoming call (flashing red) or new voice message (steady red).
2	Phone screen	Shows information about your phone such as directory number, active call and line status, softkey options, speed dials, placed calls, and phone menu listings.
3	Softkey buttons	Enables softkey options displayed on the phone screen.
4	Transfer button	Transfers a call.

Table 1-1   Features on the Cisco Unified IP Phone 6921 (continued)

5	Conference button	Creates a conference call.
6	Hold button	Places an active call on hold.
7	Navigation bar and Select button	The Navigation bar allows you to scroll through menus and highlight items. When phone is on-hook, displays phone numbers from your Placed Call listings (up arrow) or your speed dials (down arrow). The Select button (in the middle of the Navigation bar) allows you to select a highlighted item.
8	Line 1 and Line 2 buttons	Line 1 selects the primary phone line. Phone lines (line buttons). Depending on the settings, Line 2 may provide access to: • Secondary phone line • Speed-dial numbers (speed-dial buttons) • Web-based services (for example, a Personal Address Book button) Buttons illuminate to indicate status: • Green, steady—Active call • Green, flashing—Held call • Amber, flashing—Incoming call or reverting call • Red, steady—Remote line in use (shared line) • Red, flashing—Remote line on hold
9	Headset button	Toggles the headset on or off. When the headset is on, the button is lit.
10	Speakerphone button	Toggles the speakerphone on or off. When the speakerphone is on, the button is lit.
11	Keypad	Allows you to dial phone numbers, enter letters, and choose menu items.
12	Mute button	Toggles the microphone on or off. When the microphone is muted, the button is lit.
13	Volume button	Controls the handset, headset, and speakerphone volume (off-hook) and the ringer volume (on-hook).
14	Messages button	Auto-dials your voicemail (varies by system).
15	Applications button	Opens/closes the Applications menu. Use it to access call history, user preferences, phone settings, administration settings, and phone information.

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Table 1-1   Features on the Cisco Unified IP Phone 6921 (continued)

16	Contacts button	Opens/closes the Directories and the Subscribed phone services menus. Use it to access personal and corporate directories.
17	Handset	Phone handset.

Figure 1-2 shows the main components of the Cisco Unified IP Phone 6941.

Figure 1-2   Cisco Unified IP Phone 6941

Table 1-2 describes the buttons on the Cisco Unified IP Phone 6941.

Table 1-2   Features on the Cisco Unified IP Phone 6941

1	Handset light strip	Indicates an incoming call (flashing red) or new voice message (steady red).
2	Phone screen	Shows information about your phone such as directory number, active call and line status, softkey options, speed dials, placed calls, and phone menu listings.

Table 1-2   Features on the Cisco Unified IP Phone 6941

3	Programmable feature buttons	Depending on the configuration, programmable feature buttons provide access to: • Phone lines and intercom lines • Speed-dial numbers (speed-dial buttons, including the line status speed-dial features) • Web-based services (for example, a Personal Address Book button) • Call features (for example, a Privacy button) Buttons illuminate to indicate status: • Green, steady—Active call or two-way intercom call • Green, flashing—Held call • Amber, steady—Privacy in use, one-way intercom call, DND active, or logged into Hunt Group • Amber, flashing—Incoming call or reverting call • Red, steady—Remote line in use (shared line or line status) • Red, flashing—Remote line on hold
4	Softkey buttons	Enables softkey options displayed on the phone screen.
5	Transfer button	Transfers a call.
6	Conference button	Creates a conference call.
7	Hold button	Places an active call on hold.
8	Navigation bar and Select button	The Navigation bar allows you to scroll through menus and highlight items. When phone is on-hook, displays phone numbers from your Placed Call listings (up arrow) or your speed dials (down arrow). The Select button (in the middle of the Navigation bar) allows you to select a highlighted item.
9	Headset button	Toggles the headset on or off. When the headset is on, the button is lit.
10	Speakerphone button	Toggles the speakerphone on or off. When the speakerphone is on, the button is lit.
11	Keypad	Allows you to dial phone numbers, enter letters, and choose menu items (by entering the item number).
12	Mute button	Toggles the microphone on or off. When the microphone is muted, the button is lit.

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Table 1-2   Features on the Cisco Unified IP Phone 6941

13	Volume button	Controls the handset, headset, and speakerphone volume (off-hook) and the ringer volume (on-hook).
14	Messages button	Auto-dials your voice message service (varies by service).
15	Applications button	Opens/closes the Applications menu. Use it to access call history, user preferences, phone settings, administration settings, and phone information.
16	Contacts button	Opens/closes the Directories menu. Use it to access personal and corporate directories.
17	Handset	Phone handset.

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Figure 1-3 shows the main components of the Cisco Unified IP Phone 6961.

Figure 1-3   **Cisco Unified IP Phone 6961**
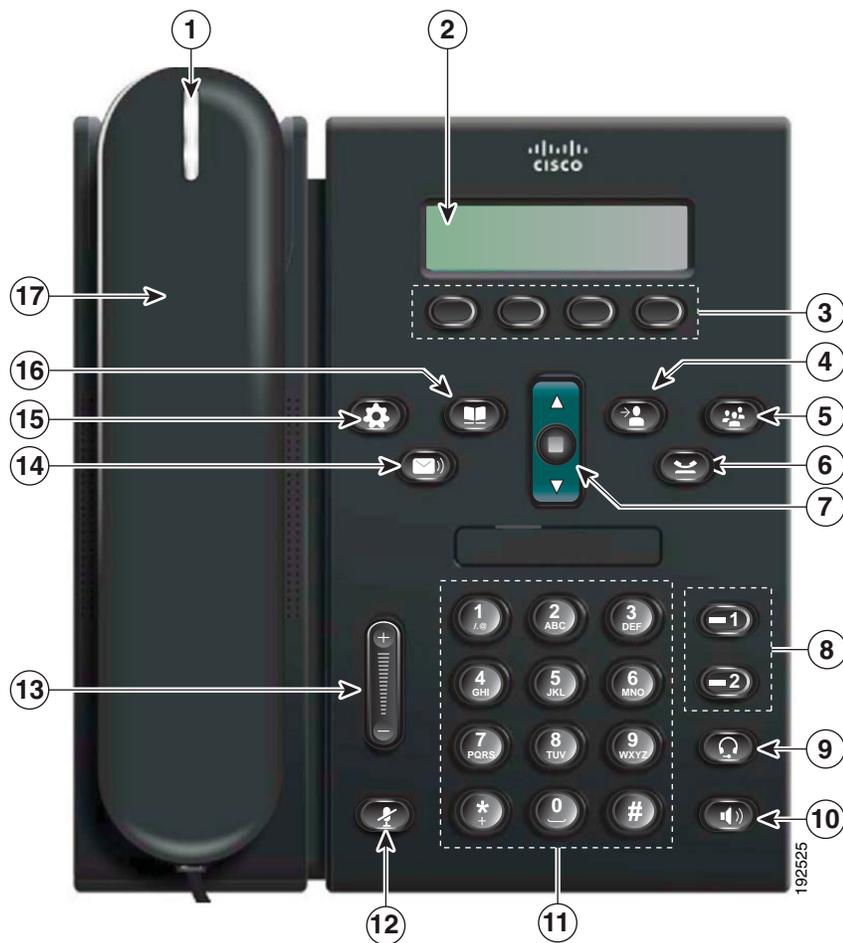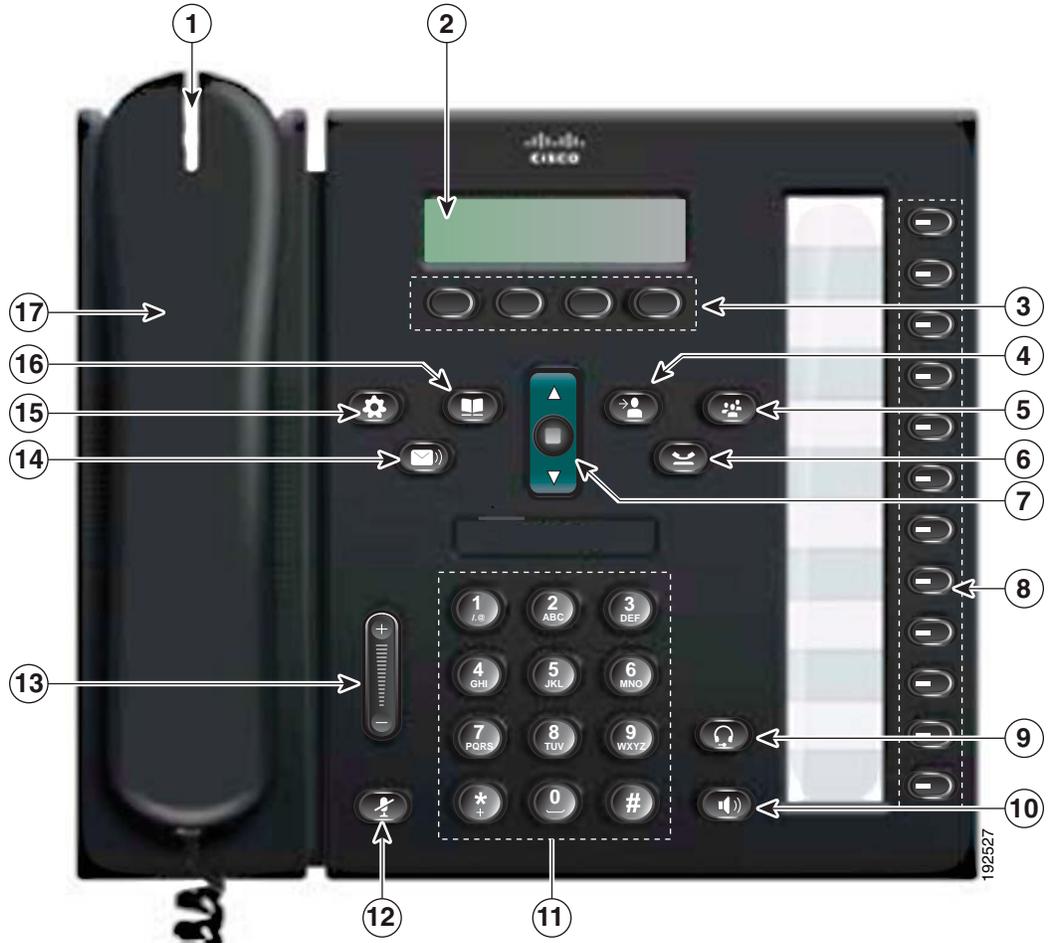

Table 1-3 describes the buttons on the Cisco Unified IP Phone 6961.

Table 1-3   **Features on the Cisco Unified IP Phone 6961**

1	Handset light strip	Indicates an incoming call (flashing red) or new voice message (steady red).
2	Phone screen	Shows information about your phone such as directory number, active call and line status, softkey options, speed dials, placed calls, and phone menu listings.
3	Softkey buttons	Enables softkey options displayed on the phone screen.
4	Transfer button	Transfers a call.
5	Conference button	Creates a conference call.

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Table 1-3   Features on the Cisco Unified IP Phone 6961

6	Hold button	Places an active call on hold.
7	Navigation bar and select button	The Navigation bar allows you to scroll through menus and highlight items. When phone is on-hook, displays phone numbers from your Placed Call listings (up arrow) or your speed dials (down arrow). The Select button allows you to select a highlighted item.
8	Programmable feature buttons	Depending on the configuration, programmable feature buttons provide access to: • Phone lines and intercom lines • Speed-dial numbers (speed-dial buttons, including the line status speed-dial features) • Web-based services (For example, a Personal Address Book button) • Call features (For example, a Privacy button) Buttons illuminate to indicate status: • Green, steady—Active call or two-way intercom call • Green, flashing—Held call • Amber, steady—Privacy in use, one-way intercom call, DND active, or logged into Hunt Group • Amber, flashing—Incoming call or reverting call • Red, steady—Remote line in use (shared line or line status) • Red, flashing—Remote line on hold
9	Headset button	Toggles the headset on or off. When the headset is on, the button is lit.
10	Speakerphone button	Toggles the speakerphone on or off. When the speakerphone is on, the button is lit.
11	Keypad	Allows you to dial phone numbers, enter letters, and choose menu items (by entering the item number).
12	Mute button	Toggles the microphone on or off. When the microphone is muted, the button is lit.
13	Volume button	Controls the handset, headset, and speakerphone volume (off-hook) and the ringer volume (on-hook).
14	Messages button	Auto-dials your voice messaging system (varies by system).

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Table 1-3   Features on the Cisco Unified IP Phone 6961

15	Applications button	Opens/closes the Applications menu. Use it to access call history, user preferences, phone settings, administration settings, and phone information.
16	Contacts button	Opens/closes the Directories menu. Use it to access personal and corporate directories.
17	HandSet	Phone handset.

What Networking Protocols are Used?

Cisco Unified IP Phones support several industry-standard and Cisco networking protocols required for voice communication. Table 1-4 provides an overview of the networking protocols that the Cisco Unified IP Phones 6921, 6941, and 6961 support.

Table 1-4   Supported Networking Protocols on the Cisco Unified IP Phone

Networking Protocol	Purpose	Usage Notes
Bootstrap Protocol (BootP)	BootP enables a network device such as the Cisco Unified IP Phone to discover certain startup information, such as its IP address.	—
Cisco Audio Session Tunneling (CAST)	The CAST protocol allows IP phones and associated applications behind the phone to discover and communicate with the remote endpoints without requiring changes to the traditional signaling components like Cisco Unified Communications Manager (Cisco Unified CM) and gateways. The Cast protocol allows separate hardware devices to synchronize related media and it allows PC applications to augment non Video capable phones to become video enabled by using the PC as the video resource.	—
Cisco Discovery Protocol (CDP)	CDP is a device-discovery protocol that runs on all Cisco-manufactured equipment. Using CDP, a device can advertise its existence to other devices and receive information about other devices in the network.	The Cisco Unified IP Phone uses CDP to communicate information such as auxiliary VLAN ID, per port power management details, and Quality of Service (QoS) configuration information with the Cisco Catalyst switch.

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Table 1-4   ***Supported Networking Protocols on the Cisco Unified IP Phone (continued)***

Networking Protocol	Purpose	Usage Notes
Dynamic Host Configuration Protocol (DHCP)	DHCP dynamically allocates and assigns an IP address to network devices. DHCP enables you to connect an IP phone into the network and have the phone become operational without your needing to manually assign an IP address or to configure additional network parameters.	DHCP is enabled by default. If disabled, you must manually configure the IP address, subnet mask, gateway, and a TFTP server on each phone locally. Cisco recommends that you use DHCP custom option 150. With this method, you configure the TFTP server IP address as the option value. For additional supported DHCP configurations, go to the Dynamic Host Configuration Protocol chapter and the Cisco TFTP chapter in the *Cisco Unified Communications Manager System Guide*. **Note** If you cannot use option 150, you may try using DHCP option 66.
Hypertext Transfer Protocol (HTTP)	HTTP is the standard way of transferring information and moving documents across the Internet and the web.	Cisco Unified IP Phones use HTTP for the XML services and for troubleshooting purposes.
IEEE 802.1X	The IEEE 802.1X standard defines a client-server-based access control and authentication protocol that restricts unauthorized clients from connecting to a LAN through publicly accessible ports. Until the client is authenticated, 802.1X access control allows only Extensible Authentication Protocol over LAN (EAPOL) traffic through the port to which the client is connected. After authentication is successful, normal traffic can pass through the port.	The Cisco Unified IP Phone implements the IEEE 802.1X standard by providing support for the following authentication methods: EAP-FAST, EAP-TLS, and EAP-MD5. When 802.1X authentication is enabled on the phone, you should disable the PC port and voice VLAN. Refer to the "Supporting 802.1X Authentication on Cisco Unified IP Phones" section on page 1-20 for additional information.
Internet Protocol (IP)	IP is a messaging protocol that addresses and sends packets across the network.	To communicate using IP, network devices must have an assigned IP address, subnet, and gateway. IP addresses, subnets, and gateways identifications are automatically assigned if you are using the Cisco Unified IP Phone with Dynamic Host Configuration Protocol (DHCP). If you are not using DHCP, you must manually assign these properties to each phone locally.
Link Layer Discovery Protocol (LLDP)	LLDP is a standardized network discovery protocol (similar to CDP) that is supported on some Cisco and third-party devices.	The Cisco Unified IP Phone supports LLDP on the PC port.

Table 1-4   *Supported Networking Protocols on the Cisco Unified IP Phone (continued)*

Networking Protocol	Purpose	Usage Notes
Link Layer Discovery Protocol-Media Endpoint Devices (LLDP-MED)	LLDP-MED is an extension of the LLDP standard developed for voice products.	The Cisco Unified IP Phone supports LLDP-MED on the SW port to communicate information such as: • Voice VLAN configuration • Device discovery • Power management • Inventory management For more information about LLDP-MED support, see the *LLDP-MED and Cisco Discovery Protocol* white paper: http://www.cisco.com/en/US/tech/tk652/tk701/technologies_white_paper0900aecd804cd46d.shtml
Real-Time Transport Protocol (RTP)	RTP is a standard protocol for transporting real-time data, such as interactive voice and video, over data networks.	Cisco Unified IP Phones use the RTP protocol to send and receive real-time voice traffic from other phones and gateways.
Real-Time Control Protocol (RTCP)	RTCP works in conjunction with RTP to provide QoS data (such as jitter, latency, and round trip delay) on RTP streams.	RTCP is disabled by default, but you can enable it on a per phone basis by using Cisco Unified CM.
Skinny Client Control Protocol (SCCP)	SCCP includes a messaging set that allows communications between call control servers and endpoint clients such as IP Phones. SCCP is proprietary to Cisco Systems.	Cisco Unified IP Phone 6921, 6941, and 6961 use SCCP, version 15 for call control.
Transmission Control Protocol (TCP)	TCP is a connection-oriented transport protocol.	Cisco Unified IP Phones use TCP to connect to Cisco Unified CM and to access XML services.
Transport Layer Security (TLS)	TLS is a standard protocol for securing and authenticating communications.	When security is implemented, Cisco Unified IP Phones use the TLS protocol when securely registering with Cisco Unified CM. For more information, refer to the *Cisco Unified Communications Manager Security Guide.*
Trivial File Transfer Protocol (TFTP)	TFTP allows you to transfer files over the network. On the Cisco Unified IP Phone, TFTP enables you to obtain a configuration file specific to the phone type.	TFTP requires a TFTP server in your network, which can be automatically identified from the DHCP server. If you want a phone to use a TFTP server other than the one specified by the DHCP server, you must manually assign the IP address of the TFTP server by using the Network Setup menu on the phone. For more information, go to the Cisco TFTP chapter in the *Cisco Unified Communications Manager System Guide*.
User Datagram Protocol (UDP)	UDP is a connectionless messaging protocol for delivery of data packets.	Cisco Unified IP Phones transmit and receive RTP streams, which utilize UDP.

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Chapter 1   An Overview of the Cisco Unified IP Phone

What Features are Supported on the Cisco Unified IP Phone 6921, 6941, and 6961?

Related Topics

What Features are Supported on the Cisco Unified IP Phone 6921, 6941, and 6961?

Cisco Unified IP Phones function much like a digital business phone, allowing you to place and receive phone calls. In addition to traditional telephony features, the Cisco Unified IP Phone includes features that enable you to administer and monitor the phone as a network device.

This section includes the following topics:

Feature Overview

Cisco Unified IP Phones provide traditional telephony functionality, such as call forwarding and transferring, redialing, speed dialing, conference calling, and voice messaging system access. Cisco Unified IP phones also provide a variety of other features. For an overview of the telephony features that the Cisco Unified IP Phone supports and for tips on configuring them, see the "Telephony Features Available for the Cisco Unified IP Phone" section on page 5-1.

As with other network devices, you must configure Cisco Unified IP Phones to prepare them to access Cisco Unified CM and the rest of the IP network. By using DHCP, you have fewer settings to configure on a phone, but if your network requires it, you can manually configure an IP address, TFTP server, subnet information, and so on. For instructions on configuring the network settings on the Cisco Unified IP Phones, see Chapter 4, "Configuring Settings on the Cisco Unified IP Phone."

Cisco Unified IP Phones can interact with other services and devices on your IP network to provide enhanced functionality. For example, you can integrate Cisco Unified CM with the corporate Lightweight Directory Access Protocol 3 (LDAP3) standard directory to enable users to search for co-worker contact information directly from their IP phones. You can also use XML to enable users to access information such as weather, stocks, quote of the day, and other web-based information. For information about configuring such services, see the "Join and Direct Transfer Policy" section on page 5-14 and the "Setting Up Services" section on page 5-19.

Finally, because the Cisco Unified IP Phone is a network device, you can obtain detailed status information from it directly. This information can assist you with troubleshooting any problems users might encounter when using their IP phones. See Chapter 7, "Viewing Model Information, Status, and Statistics on the Cisco Unified IP Phone," for more information.

Chapter 1   An Overview of the Cisco Unified IP Phone

What Features are Supported on the Cisco Unified IP Phone 6921, 6941, and 6961?

Related Topics

- Configuring Settings on the Cisco Unified IP Phone, page 4-1
- Configuring Features, Templates, Services, and Users, page 5-1
- Troubleshooting and Maintenance, page 9-1

Configuring Telephony Features

You can modify additional settings for the Cisco Unified IP Phone from Cisco Unified CM Administration. Use Cisco Unified CM Administration to set up phone registration criteria and calling search spaces, to configure corporate directories and services, and to modify phone button templates, among other tasks. See the "Telephony Features Available for the Cisco Unified IP Phone" section on page 5-1 and the Cisco Unified CM documentation for additional information.

For more information about Cisco Unified CM Administration, refer to Cisco Unified CM documentation, including *Cisco Unified Communications Manager Administration Guide*. You can also use the context-sensitive help available within the application for guidance.

You can access Cisco Unified CM documentation at this location:

http://www.cisco.com/en/US/products/sw/voicesw/ps556/tsd_products_support_series_home.html

You can access Cisco Unified Communications Manager Business Edition documentation at this location:

http://www.cisco.com/en/US/products/ps7273/tsd_products_support_series_home.html

Related Topic

- Telephony Features Available for the Cisco Unified IP Phone, page 5-1

Configuring Network Parameters Using the Cisco Unified IP Phone

You can configure parameters such as DHCP, TFTP, and IP settings on the phone itself. You can also obtain statistics about a current call or firmware versions on the phone.

For more information about configuring features and viewing statistics from the phone, see Chapter 4, "Configuring Settings on the Cisco Unified IP Phone" and see Chapter 7, "Viewing Model Information, Status, and Statistics on the Cisco Unified IP Phone."

Providing Users with Feature Information

If you are a system administrator, you are likely the primary source of information for Cisco Unified IP Phone users in your network or company. To ensure that you distribute the most current feature and procedural information, familiarize yourself with Cisco Unified IP Phone documentation on the Cisco Unified IP Phone web site:

http://www.cisco.com/en/US/products/ps10326/tsd_products_support_series_home.html

From this site, you can view various user documentation.

In addition to providing documentation, it is important to inform users of available Cisco Unified IP Phone features—including those specific to your company or network—and of how to access and customize those features, if appropriate.

For a summary of some of the key information that phone users need their system administrators to provide, see Appendix A, "Providing Information to Users Via a Website."

Understanding Security Features for Cisco Unified IP Phones

Implementing security in the Cisco Unified CM system prevents identity theft of the phone and Cisco Unified CM server, prevents data tampering, and prevents call signaling and media stream tampering.

To alleviate these threats, the Cisco IP telephony network establishes and maintains secure communication streams between a phone and the server, digitally signs files before they are transferred to a phone, and encrypts media streams and call signaling between Cisco Unified IP phones.

The Cisco Unified IP Phone 6921, 6941, and 6961 use the Phone security profile, which defines whether the device is nonsecure or encrypted. For information on applying the security profile to the phone, refer to the *Cisco Unified Communications Manager Security Guide*.

If you configure security-related settings in Cisco Unified CM Administration, the phone configuration file will contain sensitive information. To ensure the privacy of a configuration file, you must configure it for encryption. For detailed information, refer to the "Configuring Encrypted Phone Configuration Files" chapter in *Cisco Unified Communications Manager Security Guide*.

Table 1-5 shows where you can find additional information about security in this and other documents.

Table 1-5   Cisco Unified IP Phone and Cisco Unified CM Security Topics

Topic	Reference
Detailed explanation of security, including set up, configuration, and troubleshooting information for Cisco Unified CM and Cisco Unified IP Phones	Refer to the *Troubleshooting Guide for Cisco Unified Communications Manager*
Security features supported on the Cisco Unified IP Phone	See the "Overview of Supported Security Features" section on page 1-15
Restrictions regarding security features	See the "Security Restrictions" section on page 1-21
Viewing a security profile name	See the "Understanding Security Profiles" section on page 1-17
Identifying phone calls for which security is implemented	See the "Identifying Encrypted Phone Calls" section on page 1-17
TLS connection	- See the "What Networking Protocols are Used?" section on page 1-9 - See the "Adding Phones to the Cisco Unified CM Database" section on page 2-8
Security and the phone startup process	See the "Understanding the Phone Startup Process" section on page 2-6
Security and phone configuration files	See the "Adding Phones to the Cisco Unified CM Database" section on page 2-8
Changing the TFTP Server 1 or TFTP Server 2 option on the phone when security is implemented.	See Table 4-2, in the "Network Setup Menu" section on page 4-4
Items on the Security Configuration menu that you access from the Device Configuration menu on the phone	See the "Security Configuration Menu" section on page 4-8

Table 1-5   Cisco Unified IP Phone and Cisco Unified CM Security Topics (continued)

Topic	Reference
Items on the Security Configuration menu that you access from the Settings menu on the phone	See the "Security Configuration Menu" section on page 4-8
Unlocking the CTL file	See the "Unlocking and Locking Options" section on page 4-3
Disabling access to a phone's web pages	See the "Disabling and Enabling Web Page Access" section on page 8-3
Troubleshooting	• See the "Troubleshooting Cisco Unified IP Phone Security" section on page 9-8 • Refer to the *Troubleshooting Guide for Cisco Unified Communications Manager*
Deleting the CTL file from the phone	See the "Resetting or Restoring the Cisco Unified IP Phone" section on page 9-12
Resetting or restoring the phone	See the "Resetting or Restoring the Cisco Unified IP Phone" section on page 9-12
802.1X Authentication for Cisco Unified IP Phones	See these sections: • "Supporting 802.1X Authentication on Cisco Unified IP Phones" section on page 1-20 • "Security Configuration Menu" section on page 4-8 • "Status Menu" section on page 7-2 • "Troubleshooting Cisco Unified IP Phone Security" section on page 9-8

All Cisco Unified IP Phones that support Cisco Unified CM use a security profile, which defines whether the phone is nonsecure or secure.

For information about configuring the security profile and applying the profile to the phone, refer to *Cisco Unified Communications Manager Security Guide*.

Overview of Supported Security Features

Table 1-6 provides an overview of the security features that the Cisco Unified IP Phone 6921, 6941, and 6961 support. For more information about these features and about Cisco Unified CM and Cisco Unified IP Phone security, refer to *Cisco Unified Communications Manager Security Guide*.

For information about current security settings on a phone, choose **Applications > Admin Settings > Security Setup > Security Configuration**. For more information, see the "Security Configuration Menu" section on page 4-8.

Note   Most security features are available only if a certificate trust list (CTL) is installed on the phone. For more information about the CTL, refer to "Configuring the Cisco CTL Client" chapter in *Cisco Unified Communications Manager Security Guide*.

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Table 1-6   Overview of Security Features

Feature	Description
Image authentication	Signed binary files (with the extension .sgn) prevent tampering with the firmware image before it is loaded on a phone. Tampering with the image causes a phone to fail the authentication process and reject the new image.
Customer-site certificate installation	Each Cisco Unified IP Phone requires a unique certificate for device authentication. Phones include a manufacturing installed certificate (MIC), but for additional security, you can specify in Cisco Unified CM Administration that a certificate be installed by using the Certificate Authority Proxy Function (CAPF). Alternatively, you can install a Locally Significant Certificate (LSC) from the Security Configuration menu on the phone. See the "Configuring Security on the Cisco Unified IP Phone" section on page 3-13 for more information.
Device authentication	Occurs between the Cisco Unified CM server and the phone when each entity accepts the certificate of the other entity. Determines whether a secure connection between the phone and a Cisco Unified CM should occur; and, if necessary, creates a secure signaling path between the entities by using TLS protocol. Cisco Unified CM will not register phones unless they can be authenticated by the Cisco Unified CM.
File authentication	Validates digitally signed files that the phone downloads. The phone validates the signature to make sure that file tampering did not occur after the file creation. Files that fail authentication are not written to Flash memory on the phone. The phone rejects such files without further processing.
Signaling Authentication	Uses the TLS protocol to validate that no tampering has occurred to signaling packets during transmission.
Manufacturing installed certificate	Each Cisco Unified IP Phone contains a unique manufacturing installed certificate (MIC), which is used for device authentication. The MIC is a permanent unique proof of identity for the phone, and allows Cisco Unified CM to authenticate the phone.
Secure SRST reference	After you configure a SRST reference for security and then reset the dependent devices in Cisco Unified CM Administration, the TFTP server adds the SRST certificate to the phone cnf.xml file and sends the file to the phone. A secure phone then uses a TLS connection to interact with the SRST-enabled router.
Media encryption	Uses SRTP to ensure that the media streams between supported devices proves secure and that only the intended device receives and reads the data. Includes creating a media master key pair for the devices, delivering the keys to the devices, and securing the delivery of the keys while the keys are in transport.
Signaling encryption	Ensures that all SCCP signaling messages that are sent between the device and the Cisco Unified CM server are encrypted.
CAPF (Certificate Authority Proxy Function)	Implements parts of the certificate generation procedure that are too processing-intensive for the phone, and interacts with the phone for key generation and certificate installation. The CAPF can be configured to request certificates from customer-specified certificate authorities on behalf of the phone, or it can be configured to generate certificates locally.
Security profiles	Defines whether the phone is nonsecure or encrypted. See the "Understanding Security Profiles" section on page 1-17 for more information.
Encrypted configuration files	Lets you ensure the privacy of phone configuration files.

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Table 1-6   Overview of Security Features (continued)

Feature	Description
Optional disabling of the web server functionality for a phone	You can prevent access to a phone's web page, which displays a variety of operational statistics for the phone. See the "Disabling and Enabling Web Page Access" section on page 8-3.
Phone hardening	Additional security options, which you control from Cisco Unified CM Administration: • Disabling PC port • Disabling PC Voice VLAN access • Disabling access to web pages for a phone **Note** You can view current settings for the PC Port Disabled, GARP Enabled, and Voice VLAN enabled options by looking at the phone's Security Configuration menu. For more information, see the "Security Configuration Menu" section on page 4-8.
802.1X Authentication	The Cisco Unified IP Phone can use 802.1X authentication to request and gain access to the network. See the "Supporting 802.1X Authentication on Cisco Unified IP Phones" section on page 1-20 for more information.

Related Topics

- Understanding Security Profiles, page 1-17

- Identifying Encrypted Phone Calls, page 1-17

- Security Restrictions, page 1-21

Understanding Security Profiles

All Cisco Unified IP Phones that support Cisco Unified CM use a security profile, which defines whether the phone is nonsecure or encrypted. For information about configuring the security profile and applying the profile to the phone, refer to *Cisco Unified Communications Manager Security Guide*.

To view the security mode that is set for the phone, look at the Security Mode setting in the Security Configuration menu. For more information, see the "Security Configuration Menu" section on page 4-8.

Related Topics

- Identifying Encrypted Phone Calls, page 1-17

- Security Restrictions, page 1-21

Identifying Encrypted Phone Calls

When security is implemented for a phone, you can identify encrypted phone calls by icons on the screen on the phone. You can also determine if the connected phone is secure and protected if a security tone plays at the beginning of the call.

In a secure call, all call signaling and media streams are encrypted. An encrypted call offers a high level of security, providing integrity and privacy to the call. When a call in progress is being encrypted, the call progress icon to the right of the call duration timer in the phone LCD screen changes to the lock icon: 🔒

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Note If the call is routed through non-IP call legs, for example, PSTN, the call may be nonsecure even though it is encrypted within the IP network and has a lock icon associated with it.

In a secure call, a security tone plays at the beginning of a call to indicate that the other connected phone is also receiving and transmitting encrypted audio and video (if video is involved). If your call is connected to a non-protected phone, the security tone does not play.

Note Secured calling is supported for connections between two phones only. Some features, such as conference calling, shared lines, Cisco Extension Mobility, and Join Across Lines are not available when secured calling is configured.

Related Topic

- Understanding Security Profiles, page 1-17
- Understanding Security Features for Cisco Unified IP Phones, page 1-14
- Security Restrictions, page 1-21

Establishing and Identifying Secure Conference Calls

You can initiate a secure conference call and monitor the security level of participants. A secure conference call is established using this process:

1. A user initiates the conference from a secure phone.

2. Cisco Unified CM assigns a secure conference bridge to the call.

3. As participants are added, Cisco Unified CM verifies the security mode of each phone and maintains the secure level for the conference.

4. The phone displays the security level of the conference call. A secure conference displays the 🔒 to the right of "Conference" on the phone screen.

Note There are interactions, restrictions, and limitations that affect the security level of the conference call depending on the security mode of the participant's phones and the availability of secure conference bridges. See Table 1-7 and Table 1-8 for information about these interactions.

Establishing and Identifying Protected Calls

A protected call is established when your phone, and the phone on the other end, is configured for protected calling. The other phone can be in the same Cisco IP network, or on a network outside the IP network. Protected calls can only be made between two phones. Conference calls and other multiple-line calls are not supported.

A protected call is established using this process:

1. A user initiates the call from a protected phone (protected security mode).

2. The phone displays the 🔒 icon (encrypted) on the phone screen. This icon indicates that the phone is configured for secure (encrypted) calls, but this does not mean that the other connected phone is also protected.

3. A security tone plays if the call is connected to another protected phone, indicating that both ends of the conversation are encrypted and protected. If the call is connected to a non-protected phone, then the secure tone is not played.

Note   Protected calling is supported for conversations between two phones. Some features, such as conference calling, shared lines, Cisco Extension Mobility, and Join Across Lines are not available when protected calling is configured.

Call Security Interactions and Restrictions

Cisco Unified CM checks the phone security status when conferences are established and changes the security indication for the conference or blocks the completion of the call to maintain integrity and also security in the system. Table 1-7 provides information about changes to call security levels when using Barge.

Table 1-7   Call Security Interactions When Using Barge

Initiator's Phone Security Level	Feature Used	Call Security Level	Results of Action
Non-secure	Barge	Encrypted call	Call barged and identified as nonsecure call
Secure	Barge	Secure call	Call barged and identified as Secure call

Table 1-8 provides information about changes to conference security levels depending on the initiator's phone security level, the security levels of participants, and the availability of secure conference bridges.

Table 1-8   Security Restrictions with Conference Calls

Initiator's Phone Security Level	Feature Used	Security Level of Participants	Results of Action
Non-secure	Conference	Encrypted	Nonsecure conference bridge Nonsecure conference
Secure	Conference	At least one member is non-secure	Secure conference bridge Nonsecure conference
Secure	Conference	All participants are encrypted	Secure conference bridge Secure encrypted level conference
Secure	Join	Encrypted	Secure conference bridge Conference remains secure
Non-secure	cBarge	All participants are encrypted	Secure conference bridge Conference changes to non-secure

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Table 1-8   Security Restrictions with Conference Calls (continued)

Initiator's Phone Security Level	Feature Used	Security Level of Participants	Results of Action
Non-secure	MeetMe	Minimum security level is encrypted	Initiator receives message "Does not meet Security Level, call rejected."
Secure	MeetMe	Minimum security level is nonsecure	Only secure conference bridge available and used Conference accepts all calls

Supporting 802.1X Authentication on Cisco Unified IP Phones

These sections provide information about 802.1X support on the Cisco Unified IP Phones:

Overview

Cisco Unified IP phones and Cisco Catalyst switches have traditionally used Cisco Discovery Protocol (CDP) to identify each other and determine parameters such as VLAN allocation and inline power requirements. However, CDP is not used to identify any locally attached PCs; therefore, Cisco Unified IP Phones provide an EAPOL pass-through mechanism, whereby a PC locally attached to the IP phone, may pass through EAPOL messages to the 802.1X authenticator in the LAN switch. This prevents the IP phone from having to act as the authenticator, yet allows the LAN switch to authenticate a data end point prior to accessing the network.

In conjunction with the EAPOL pass-through mechanism, Cisco Unified IP Phones provide a proxy EAPOL-Logoff mechanism. In the event that the locally attached PC is disconnected from the IP phone, the LAN switch would not see the physical link fail, because the link between the LAN switch and the IP phone is maintained. To avoid compromising network integrity, the IP phone sends an EAPOL-Logoff message to the switch, on behalf of the downstream PC, which triggers the LAN switch to clear the authentication entry for the downstream PC.

The Cisco Unified IP phones also contain an 802.1X supplicant, in addition to the EAPOL pass-through mechanism. This supplicant allows network administrators to control the connectivity of IP phones to the LAN switch ports. The current release of the phone 802.1X supplicant uses the EAP-FAST, EAP-TLS, and EAP-MD5 options for network authentication.

Required Network Components

Support for 802.1X authentication on Cisco Unified IP Phones requires several components, including:

- Cisco Unified IP Phone—The phone acts as the 802.1X *supplicant*, which initiates the request to access the network.
- Cisco Secure Access Control Server (ACS) (or other third-party authentication server)—The authentication server and the phone must both be configured with a shared secret that is used to authenticate the phone.

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- Cisco Catalyst Switch (or other third-party switch)—The switch must support 802.1X, so it can act as the *authenticator* and pass the messages between the phone and the authentication server. When the exchange is completed, the switch then grants or denies the phone access to the network.

Best Practices—Requirements and Recommendations

- Enable 802.1X Authentication—If you want to use the 802.1X standard to authenticate Cisco Unified IP Phones, be sure that you have properly configured the other components before enabling it on the phone. See the "802.1X Authentication and Status" section on page 4-9 for more information.

- Configure PC Port—The 802.1X standard does not take into account the use of VLANs and thus recommends that only a single device should be authenticated to a specific switch port. However, some switches (including Cisco Catalyst switches) support multi-domain authentication. The switch configuration determines whether you can connect a PC to the phone's PC port.

  - Enabled—If you are using a switch that supports multi-domain authentication, you can enable the PC port and connect a PC to it. In this case, Cisco Unified IP Phones support proxy EAPOL-Logoff to monitor the authentication exchanges between the switch and the attached PC. For more information about IEEE 802.1X support on the Cisco Catalyst switches, refer to the Cisco Catalyst switch configuration guides at:

    http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html

  - Disabled—If the switch does not support multiple 802.1X-compliant devices on the same port, you should disable the PC Port when 802.1X authentication is enabled. See the "Security Configuration Menu" section on page 4-8 for more information. If you do not disable this port and subsequently attempt to attach a PC to it, the switch will deny network access to both the phone and the PC.

- Configure Voice VLAN—Because the 802.1X standard does not account for VLANs, you should configure this setting based on the switch support.

  - Enabled—If you are using a switch that supports multi-domain authentication, you can continue to use the voice VLAN.

  - Disabled—If the switch does not support multi-domain authentication, disable the Voice VLAN and consider assigning the port to the native VLAN. See the "Security Configuration Menu" section on page 4-8 for more information.

- Enter MD5 Shared Secret—If you disable 802.1X authentication or perform a factory reset on the phone, the previously configured MD5 shared secret is deleted. See the "802.1X Authentication and Status" section on page 4-9 for more information.

Security Restrictions

A user cannot barge into an encrypted call if the phone that is used to barge is not configured for encryption. When barge fails in this case, a reorder tone (fast busy tone) plays on the phone on which the user initiated the barge.

If the initiator phone is configured for encryption, the barge initiator can barge into a nonsecure call from the encrypted phone. After the barge occurs, Cisco Unified CM classifies the call as nonsecure.

If the initiator phone is configured for encryption, the barge initiator can barge into an encrypted call, and the phone indicates that the call is encrypted.

Overview of Configuring and Installing Cisco Unified IP Phones

When deploying a new IP telephony system, system administrators and network administrators must complete several initial configuration tasks to prepare the network for IP telephony service. For information and a checklist for setting up and configuring a Cisco IP telephony network, go to the System Configuration Overview chapter in *Cisco Unified Communications Manager System Guide*.

After you have set up the IP telephony system and configured system-wide features in Cisco Unified CM, you can add IP phones to the system.

The following topics provide an overview of procedures for adding Cisco Unified IP Phones to your network:

- Configuring Cisco Unified IP Phones in Cisco Unified CM, page 1-22

- Installing Cisco Unified IP Phones, page 1-26

Configuring Cisco Unified IP Phones in Cisco Unified CM

To add phones to the Cisco Unified CM database, you can use:

- Auto-registration

- Cisco Unified CM Administration

- Bulk Administration Tool (BAT)

- BAT and the Tool for Auto-Registered Phones Support (TAPS)

For more information about these choices, see the "Adding Phones to the Cisco Unified CM Database" section on page 2-8.

For general information about configuring phones in Cisco Unified CM, refer to the following documentation:

- Cisco Unified IP Phones, *Cisco Unified Communications Manager System Guide*

- Cisco Unified IP Phone Configuration, *Cisco Unified Communications Manager Administration Guide*

- Autoregistration Configuration, *Cisco Unified Communications Manager Administration Guide*

Checklist for Configuring the Cisco Unified IP Phones 6921, 6941, and 6961 in Cisco Unified CM

Table 1-9 provides an overview and checklist of configuration tasks for the Cisc Unified IP Phones 6921, 6941, and 6961 in Cisco Unified CM Administration. The list presents a suggested order to guide you through the phone configuration process. Some tasks are optional, depending on your system and user needs. For detailed procedures and information, refer to the sources in the list.

Table 1-9   Checklist for Configuring the Cisco Unified IP Phones 6921, 6941, and 6961 in Cisco Unified CM

Task	Purpose	For More Information
1.	Gather the following information about the phone: • Phone Model • MAC address • Physical location of the phone • Name or user ID of phone user • Device pool • Partition, calling search space, and location information • Number of lines and associated directory numbers (DNs) to assign to the phone • Cisco Unified CM user to associate with the phone • Phone usage information that affects phone button template, softkey template, phone features, IP Phone services, or phone applications Provides list of configuration requirements for setting up phones. Identifies preliminary configuration that you need to perform before configuring individual phones, such as phone button templates or softkey templates.	For more information, go to the "Cisco Unified IP Phones chapter in the *Cisco Unified Communications Manager System Guide*. See the "Telephony Features Available for the Cisco Unified IP Phone" section on page 5-1.
2.	Verify that you have sufficient unit licenses for your phone.	For more information, go to the License Unit Report chapter in the *Cisco Communications Manager Administration Guide*.
3.	Customize phone button templates (if required). Changes the number of line buttons, speed-dial buttons, Service URL buttons or adds a Privacy button to meet user needs.	For more information, go to the Phone Button Template Configuration chapter in the *Cisco Communications Manager Administration Guide*. See the "Modifying Phone Button Templates" section on page 5-16.

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Table 1-9   *Checklist for Configuring the Cisco Unified IP Phones 6921, 6941, and 6961 in Cisco Unified CM (continued)*

Task	Purpose	For More Information
4.	Add and configure the phone by completing the required fields in the Phone Configuration window. Required fields are indicated by an asterisk (*) next to the field name; for example, MAC address and device pool. The device with its default settings gets added to the Cisco Unified CM database.	For more information, go to the Cisco Unified IP Phone Configuration chapter in the *Cisco Communications Manager Administration Guide*. For information about Product Specific Configuration fields, refer to "?" Button Help in the Phone Configuration window. **Note** If you want to add both the phone and user to the Cisco Unified CM database at the same time, go to the User/Phone Add Configuration chapter in the *Cisco Communications Manager Administration Guide*.
5.	Add and configure directory numbers (lines) on the phone by completing the required fields in the Directory Number Configuration window. Required fields are indicated by an asterisk (*) next to the field name; for example, directory number and presence group. Adds primary and secondary directory numbers and features associated with directory numbers to the phone.	For more information, go to the "Directory Number Configuration" chapter in the *Cisco Unified Communications Manager Administration Guide*. See the "Telephony Features Available for the Cisco Unified IP Phone" section on page 5-1.
6.	Customize softkey templates. Adds, deletes, or changes order of softkey features that display on the user's phone to meet feature usage needs.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, Softkey Template Configuration. For more information, see the *Cisco Unified Communications Manager Administration Guide*, Cisco Unified IP Phone Configuration.
7.	Configure speed-dial buttons and assign speed-dial numbers (optional). Adds speed-dial buttons and numbers. Users can change speed-dial settings on their phones by using Cisco Unified CM User Options.	For more information, see the *Cisco Unified Communications Manager Administration Guid*, Cisco Unified IP Phone Configuration.
8.	Configure Cisco Unified IP Phone services and assign services (optional). Provides IP Phone services. **Note** Users can add or change services on their phones by using the Cisco Unified CM User Options.	For more information, see the *Cisco Communications Manager Administration Guide*, IP Phone Services Configuration.
9.	Assign services to programmable buttons (optional). Provides access to an IP phone service or URL.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, Cisco Unified IP Phone Configuration.

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Table 1-9   Checklist for Configuring the Cisco Unified IP Phones 6921, 6941, and 6961 in Cisco Unified CM (continued)

Task	Purpose	For More Information
10.	Add user information by configuring required fields. Required fields are indicated by an asterisk (*); for example, User ID and last name. **Note** Assign a password (for User Options web pages) and PIN (for Cisco Extension Mobility and Personal Directory). Adds user information to the global directory for Cisco Unified CM.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, End User Configuration. **Note** If your company uses a a Lightweight Directory Access Protocol (LDAP) directory to store information on users, you can install and configure Cisco Unified Communications to use your existing LDAP directory, refer to the"Configuring Corporate Directories" section on page 5-15. Once the Enable Synchronization from the LDAP Server field is enabled, you will not be able to add additional users from Cisco Unified CM Administration. **Note** If you want to add both the phone and user to the Cisco Unified CM database at the same time, see User/Phone Add Configurations in the *Cisco Unified Communications Manager Administration Guide*.
11.	Associate a user to a user group. Assigns users a common list of roles and permissions that apply to all users in a user group. Administrators can manage user groups, roles, and permissions to control the level of access (and, therefore, the level of security) for system users. **Note** In order for end users to access Cisco Unified CM User Options, you must add users to the standard Cisco CCM End Users group.	Refer to the following sections in the *Cisco Unified Communications Manager Administration Guide*, End User Configuration and User Group Configuration.
12.	Associate a user with a phone (optional). Provides users with control over their phone such a forwarding calls or adding speed-dial numbers or services. **Note** Some phones, such as those in conference rooms, do not have an associated user.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, End User Configuration.

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Installing Cisco Unified IP Phones

After you have added the phones to the Cisco Unified CM database, you can complete the phone installation. You (or the phone users) can install the phone at the users's location. The Cisco Unified IP Phone Installation Guide, which is provided on the cisco.com web site, provides directions for connecting the phone handset, cables, and other accessories.

Note   Before you install a phone, even if it is new, upgrade the phone to the current firmware image. For information about upgrading, refer to the Readme file for your phone, which is located at:

http://www.cisco.com/kobayashi/sw-center/index.shtml

After the phone is connected to the network, the phone startup process begins, and the phone registers with Cisco Unified CM. To finish installing the phone, configure the network settings on the phone depending on whether you enable or disable DHCP service.

If you used auto-registration, you need to update the specific configuration information for the phone such as associating the phone with a user, changing the button table, or directory number.

Checklist for Installing the Cisco Unified IP Phone 6921, 6941, and 6961

Table 1-10 provides an overview and checklist of installation tasks for the Cisco Unified IP Phone 6921, 6941, and 6961. The list presents a suggested order to guide you through the phone installation. Some tasks are optional, depending on your system and user needs. For detailed procedures and information, refer to the sources in the list.

Table 1-10   Installation Checklist for the Cisco Unified IP Phone 6921, 6941, and 6961

Task	Purpose	For More Information
1.	Choose the power source for the phone: • Power over Ethernet (PoE) • External power supply Determines how the phone receives power.	See the "Providing Power to the Cisco Unified IP Phone" section on page 2-3.
2.	Assemble the phone, adjust phone placement, and connect the network cable. Locates and installs the phone in the network.	See the "Installing the Cisco Unified IP Phone" section on page 3-5. See the "Footstand" section on page 3-8.
3.	Monitor the phone startup process. Adds primary and secondary directory numbers and features associated with directory numbers to the phone. Verifies that phone is configured properly.	See the "Verifying the Phone Startup Process" section on page 3-12.

Table 1-10   Installation Checklist for the Cisco Unified IP Phone 6921, 6941, and 6961 (continued)

Task	Purpose	For More Information
4.	If you are configuring the network settings on the phone, you can set up an IP address for the phone by either using DHCP or manually entering an IP address. Using DHCP—To enable DHCP and allow the DHCP server to automatically assign an IP address to the Cisco Unified IP Phone and direct the phone to a TFTP server, choose **Applications > Administrator Settings > Network Setup > IPv4 Setup** and: • To enable DHCP, set DHCP Enabled to **Yes.** DHCP is enabled by default. • To use an alternate TFTP server, set Alternate TFTP Server to **Yes,** and enter the IP address for the TFTP Server. **Note** Consult with the network administrator to determine whether you need to assign an alternative TFTP server instead of using the TFTP server assigned by DHCP. Without DHCP—You must configure the IP address, subnet mask, TFTP server, and default router locally on the phone, choose **Applications > Administrator Settings > Network Setup > IPv4 Setup**: To disable DHCP and manually set an IP address: **a.** To disable DHCP, set DHCP Enabled to **No**. **b.** Enter the static IP address for phone. **c.** Enter the subnet mask. **d.** Enter the default router IP addresses. **e.** Set Alternate TFTP Server to **Yes**, and enter the IP address for TFTP Server 1. You must also enter the domain name where the phone resides by choosing **Applications > Administrator Settings > Network Setup**.	See the "Configuring Startup Network Settings" section on page 3-13. See the "Network Setup Menu" section on page 4-4.
5.	Set up security on the phone. Provides protection against data tampering threats and identity theft of phones.	See the "Configuring Security on the Cisco Unified IP Phone" section on page 3-13.
6.	Make calls with the Cisco Unified IP Phone. Verifies that the phone and features work correctly.	Refer to *Cisco Unified IP Phone 6921, 6941, and 6961 User Guide for Cisco Unified Communications Manager 8.0.*
7.	Provide information to end users about how to use their phones and how to configure their phone options. Ensures that users have adequate information to successfully use their Cisco Unified IP Phones.	See Appendix A, "Providing Information to Users Via a Website."

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Terminology Differences

Table 1-11 highlights some of the important differences in terminology that is used in these documents:

- *Cisco Unified IP Phone 6921, 6941, and 6961 User Guide for Cisco Unified Communications Manager 8.0 (SCCP)*
- *Cisco Unified IP Phone 6921, 6941, and 6961 Administration Guide for Cisco Unified Communications Manager 8.0 (SCCP)*
- *Cisco Unified Communications Manager Administration Guide*
- *Cisco Unified Communications Manager System Guide*

Table 1-11   Terminology Differences

User Guide	Administration and System Guides
Speed-Dialing (Placing a call with a speed-dial code)	Abbreviated Dialing
Conference across Lines	Join Across Lines
Conference	Join or Conference
Line Status	Busy Lamp Field (BLF)
Message Indicators	Message Waiting Indicator (MWI) or Message Waiting Lamp
Programmable Feature Button	Programmable Line Button or Programmable Line Key (PLK)
Voicemail System	Voice Messaging System

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Preparing to Install the Cisco Unified IP Phone on Your Network

Cisco Unified IP phones enable you to communicate by using voice over a data network. To provide this capability, the IP Phones depend upon and interact with several other key Cisco Unified IP Telephony components, including Cisco Unified Communications Manager (Cisco Unified CM).

This chapter focuses on the interactions between the Cisco Unified IP Phone 6921, 6941, and 6961 and Cisco Unified CM, DNS and DHCP servers, TFTP servers, and switches. It also describes options for powering phones.

For related information about voice and IP communications, refer to this URL:

http://www.cisco.com/en/US/products/sw/voicesw/index.html

This chapter provides an overview of the interaction between the Cisco Unified IP Phone and other key components of the Voice over IP (VoIP) network. It includes the following topics:

- Understanding Interactions with Other Cisco Unified IP Telephony Products, page 2-1
- Providing Power to the Cisco Unified IP Phone, page 2-3
- Understanding Phone Configuration Files, page 2-5
- Understanding the Phone Startup Process, page 2-6
- Adding Phones to the Cisco Unified CM Database, page 2-8
- Determining the MAC Address for a Cisco Unified IP Phone, page 2-11

Understanding Interactions with Other Cisco Unified IP Telephony Products

To function in the IP telephony network, the Cisco Unified IP Phone must be connected to a networking device, such as a Cisco Catalyst switch. You must also register the Cisco Unified IP Phone with a Cisco Unified CM system before sending and receiving calls.

This section includes the following topics:

- Understanding How the Cisco Unified IP Phone Interacts with Cisco Unified CM, page 2-2
- Understanding How the Cisco Unified IP Phone Interacts with the VLAN, page 2-2

Understanding How the Cisco Unified IP Phone Interacts with Cisco Unified CM

Cisco Unified CM is an open and industry-standard call processing system. Cisco Unified CM software sets up and tears down calls between phones, integrating traditional PBX functionality with the corporate IP network. Cisco Unified CM manages the components of the IP telephony system—the phones, the access gateways, and the resources necessary for features such as call conferencing and route planning. Cisco Unified CM also provides:

- Firmware for phones
- Configuration file via TFTP service
- Authentication and encryption (if configured for the telephony system)
- Phone registration
- Call preservation, so that a media session continues if signaling is lost between the primary CM and a phone

For information about configuring Cisco Unified CM to work with the IP devices described in this chapter, go to the Cisco Unified IP Phone Configuration chapter in the *Cisco Communications Manager Administration Guide*.

For an overview of security functionality for the Cisco Unified IP Phone, see the "Understanding Security Features for Cisco Unified IP Phones" section on page 1-14.

Note If the Cisco Unified IP Phone model that you want to configure does not appear in the Phone Type drop-down list in Cisco Unified CM Administration, go to the following URL and install the latest support patch for your version of Cisco Unified CM:

http://www.cisco.com/kobayashi/sw-center/sw-voice.shtml

For more information, refer to "Software Upgrades" chapter in the *Cisco Unified Communications Operating System Administration Guide*.

Related Topic

- Telephony Features Available for the Cisco Unified IP Phone, page 5-1

Understanding How the Cisco Unified IP Phone Interacts with the VLAN

The Cisco Unified IP Phone 6921, 6941, and 6961 have an internal Ethernet switch, enabling forwarding of packets to the phone, and to the access port and the network port on the back of the phone.

If a computer is connected to the access port, the computer and the phone share the same physical link to the switch and share the same port on the switch. This shared physical link has the following implications for the VLAN configuration on the network:

- The current VLANs might be configured on an IP subnet basis. However, additional IP addresses might not be available to assign the phone to the same subnet as other devices connected to the same port.
- Data traffic present on the VLAN supporting phones might reduce the quality of Voice-over-IP traffic.
- Network security may indicate a need to isolate the VLAN voice traffic from the VLAN data traffic.

You can resolve these issues by isolating the voice traffic onto a separate VLAN. The switch port that the phone is connected to would be configured to have separate VLANs for carrying:

- Voice traffic to and from the IP phone (auxiliary VLAN on the Cisco Catalyst 6000 series, for example)
- Data traffic to and from the PC connected to the switch through the access port of the IP phone (native VLAN)

Isolating the phones on a separate, auxiliary VLAN increases the quality of the voice traffic and allows a large number of phones to be added to an existing network where there are not enough IP addresses for each phone.

For more information, refer to the documentation included with a Cisco switch. You can also access switch information at this URL:

http://cisco.com/en/US/products/hw/switches/index.html

Related Topics

- Understanding the Phone Startup Process, page 2-6
- Network Setup Menu, page 4-4

Providing Power to the Cisco Unified IP Phone

The Cisco Unified IP Phone 6921, 6941, and 6961 can be powered with external power or with Power over Ethernet (PoE). External power is provided through a separate power supply. PoE is provided by a switch through the Ethernet cable attached to a phone.

Note   When you install a phone that is powered with external power, connect the power supply to the phone and to a power outlet before you connect the Ethernet cable to the phone. When you remove a phone that is powered with external power, disconnect the Ethernet cable from the phone before you disconnect the power supply.

The following sections provide more information about powering a phone:

- Power Guidelines, page 2-4
- Power Outage, page 2-4
- Obtaining Additional Information about Power, page 2-5

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Power Guidelines

Table 2-1 provides guidelines for powering the Cisco Unified IP Phone 6921, 6941, and 6961.

Table 2-1   *Guidelines for Powering the Cisco Unified IP Phone 6921, 6941, and 6961*

Power Type	Guidelines
External power—Provided through the CP-PWR-CUBE-3 external power supply.	The Cisco Unified IP Phone 6921, 6941, and 6961 use the CP-PWR-CUBE-3 power supply.
External power—Provided through the Cisco Unified IP Phone Power Injector.	The Cisco Unified IP Phone Power Injector may be used with any Cisco Unified IP Phone. Functioning as a midspan device, the injector delivers inline power to the attached phone. The Cisco Unified IP Phone Power Injector is connected between a switch port and the IP Phone, and supports a maximum cable length of 100m between the unpowered switch and the IP Phone.
PoE power—Provided by a switch through the Ethernet cable attached to the phone.	• The Cisco Unified IP Phone 6921, 6941, and 6961 support IEEE 802.3af Class 2 power on signal pairs and spare pairs. • To ensure uninterruptible operation of the phone, make sure that the switch has a backup power supply. • Make sure that the CatOS or IOS version running on your switch supports your intended phone deployment. Refer to the documentation for your switch for operating system version information.
External power—Provided through inline power patch panel WS-PWR-PANEL	The inline power patch panel WS-PWR-PANEL is compatible with the Cisco Unified IP Phone 6921, 6941, and 6961.

Power Outage

Your accessibility to emergency service through the phone is dependent on the phone being powered. If there is an interruption in the power supply, Service and Emergency Calling Service dialing will not function until power is restored. In the case of a power failure or disruption, you may need to reset or reconfigure equipment before using the Service or Emergency Calling Service dialing.

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Obtaining Additional Information about Power

For related information about power, refer to the documents shown in Table 2-2. These documents provide information about the following topics:

- Cisco switches that work with the Cisco Unified IP Phone 6921, 6941, and 6961
- The Cisco IOS releases that support bidirectional power negotiation
- Other requirements and restrictions regarding power

Table 2-2   Related Documentation for Power

Document Topics	URL
Cisco Unified IP Phone Power Injector	http://www.cisco.com/en/US/products/ps6951/index.html
PoE Solutions	http://www.cisco.com/en/US/netsol/ns340/ns394/ns147/ns412/networking_solutions_package.html
Cisco Catalyst Switches	http://cisco.com/en/US/products/hw/switches/index.html
Integrated Service Routers	http://www.cisco.com/en/US/products/hw/routers/index.html
Cisco IOS Software	http://www.cisco.com/en/US/products/sw/iosswrel/products_ios_cisco_ios_software_category_home.html

Understanding Phone Configuration Files

Configuration files for a phone are stored on the TFTP server and define parameters for connecting to Cisco Unified CM. In general, any time you make a change in Cisco Unified CM that requires the phone to be reset, a change is automatically made to the phone's configuration file.

Configuration files also contain information about which image load the phone should be running. If this image load differs from the one currently loaded on a phone, the phone contacts the TFTP server to request the required load files.

A phone accesses a default configuration file named XmlDefault.cnf.xml from the TFTP server when the following conditions exist:

- You have enabled auto-registration in Cisco Unified CM
- The phone has not been added to the Cisco Unified CM database
- The phone is registering for the first time

In addition, if the device security mode in the configuration file is set to Authenticated and the CTL file on the phone has a valid certificate for Cisco Unified CM, the phone establishes a TLS connection to Cisco Unified CM. Otherwise, the phone establishes a TCP connection.

Note   If the device security mode in the configuration file is set to secure, but the phone has not received a CTL file, the phone tries four times to obtain a CTL file so it can register securely.

Note   Cisco Extension Mobility Cross Cluster is an exception, in that the phone permits a TLS connection to Cisco Unified CM for secure signaling even without the CTL file.

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If you configure security-related settings in Cisco Unified CM Administration, the phone configuration file will contain sensitive information. To ensure the privacy of a configuration file, you must configure it for encryption. For detailed information, refer to the "Configuring Encrypted Phone Configuration Files" chapter in *Cisco Unified Communications Manager Security Guide*. A phone requests a configuration file whenever it resets and registers with Cisco Unified CM.

A phone accesses a default configuration file named XmlDefault.cnf.xml only when the phone has not received a valid Trust List file containing a certificate assigned to the Cisco Unified CM and TFTP.

If auto registration is not enabled and you did not add the phone to the Cisco Unified CM database, the phone does not attempt to register with Cisco Unified CM. The phone continually displays the "Configuring IP" message until you either enable auto-registration or add the phone to the Cisco Unified CM database.

If the phone has registered before, the phone will access the configuration file named SEPmac_address.cnf.xml, where mac_address is the MAC address of the phone.

The filenames are derived from the MAC Address and Description fields in the Phone Configuration window of Cisco Unified CM Administration. The MAC address uniquely identifies the phone.

For more information on phone configuration settings, go to the Cisco Unified IP Phone Configuration chapter in the *Cisco Communications Manager Administration Guide*.

For more information also refer to the *Cisco Unified Communications Manager Security Guide*.

Understanding the Phone Startup Process

When connecting to the VoIP network, the Cisco Unified IP Phone 6921, 6941, and 6961 go through a standard startup process that is described in Table 2-3. Depending on your specific network setup, not all of these steps may occur on your Cisco Unified IP Phone.

Table 2-3   Cisco Unified IP Phone Startup Process

Task	Purpose	Related Topics
1.	Obtaining Power from the Switch If a phone is not using external power, the switch provides in-line power through the Ethernet cable attached to the phone.	• Adding Phones to the Cisco Unified CM Database, page 2-8. • Resolving Startup Problems, page 9-1.
2.	Loading the Stored Phone Image The Cisco Unified IP Phone has non-volatile Flash memory in which it stores firmware images and user-defined preferences. At startup, the phone runs a bootstrap loader that loads a phone image stored in Flash memory. Using this image, the phone initializes its software and hardware.	Resolving Startup Problems, page 9-1.
3.	Configuring VLAN If the Cisco Unified IP Phone is connected to a Cisco Catalyst switch, the switch next informs the phone of the voice VLAN defined on the switch. The phone needs to know its VLAN membership before it can proceed with the Dynamic Host Configuration Protocol (DHCP) request for an IP address.	• Network Setup Menu, page 4-4. • Resolving Startup Problems, page 9-1.

Table 2-3   Cisco Unified IP Phone Startup Process (continued)

Task	Purpose	Related Topics
4.	Obtaining an IP Address If the Cisco Unified IP Phone is using DHCP to obtain an IP address, the phone queries the DHCP server to obtain one. If you are not using DHCP in your network, you must assign static IP addresses to each phone locally.	• Network Setup Menu, page 4-4. • Resolving Startup Problems, page 9-1.
5.	Accessing a TFTP Server In addition to assigning an IP address, the DHCP server directs the Cisco Unified IP Phone to a TFTP Server. If the phone has a statically defined IP address, you must configure the TFTP server locally on the phone; the phone then contacts the TFTP server directly. **Note** You can also assign an alternative TFTP server to use instead of the one assigned by DHCP.	• Network Setup Menu, page 4-4. • Resolving Startup Problems, page 9-1.
6.	Requesting the CTL file The TFTP server stores the certificate trust list (CTL) file. The CTL file contains the certificates necessary for establishing a secure connection between the phone and Cisco Unified CM.	Refer to the *Cisco Unified Communications Manager Security Guide*, "Configuring the Cisco CTL Client" chapter.
7.	Requesting the Configuration File The TFTP server has configuration files, which define parameters for connecting to Cisco Unified CM and other information for the phone.	• Adding Phones to the Cisco Unified CM Database, page 2-8. • Resolving Startup Problems, page 9-1.
8.	Contacting Cisco Unified CM The configuration file defines how the Cisco Unified IP Phone communicates with Cisco Unified CM and provides a phone with its load ID. After obtaining the file from the TFTP server, the phone attempts to make a connection to the highest priority Cisco Unified CM on the list. If the phone was manually added to the database, Cisco Unified CM identifies the phone. If the phone was not manually added to the database and auto-registration is enabled in Cisco Unified CM, the phone attempts to auto-register itself in the Cisco Unified CM database.	Resolving Startup Problems, page 9-1.

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Adding Phones to the Cisco Unified CM Database

Before installing the Cisco Unified IP phone, you must choose a method for adding phones to the Cisco Unified CM database. Be aware that each phone type requires a fixed number of device license units and the number of unit licenses that are available on the server may impact phone registration. For more information on licensing go to the Licenses for Phones section in the *Cisco Unified Communications Manager System Guide.*

These sections describe the methods:

- Adding Phones with Auto-Registration, page 2-8
- Adding Phones with Auto-Registration and TAPS, page 2-9
- Adding Phones with Cisco Unified CM Administration, page 2-10
- Adding Phones with BAT, page 2-10

Table 2-4 provides an overview of these methods for adding phones to the Cisco Unified CM database.

Table 2-4   Methods for Adding Phones to the Cisco Unified CM Database

Method	Requires MAC Address?	Notes
Auto-registration	No	- Results in automatic assignment of directory numbers - Not available when security or encryption is enabled **Note** Auto-registration is disabled when security is enabled on Cisco Unified CM. In this case, the phone must be manually added to the Cisco Unified CM database.
Auto-registration with TAPS	No	Requires auto-registration and the Bulk Administration Tool (BAT); updates information in the Cisco Unified IP Phone and in Cisco Unified CM Administration
Using the Cisco Unified CM Administration	Yes	Requires phones to be added individually
Using BAT	Yes	Allows for simultaneous registration of multiple phones

Adding Phones with Auto-Registration

By enabling auto-registration before you begin installing phones, you can:

- Add phones without first gathering MAC addresses from the phones.
- Automatically add a Cisco Unified IP Phone to the Cisco Unified CM database when you physically connect the phone to your IP telephony network. During auto-registration, Cisco Unified CM assigns the next available sequential directory number to the phone.
- Quickly enter phones into the Cisco Unified CM database and modify any settings, such as the directory numbers, from Cisco Unified CM.

- Move auto-registered phones to new locations and assign them to different device pools without affecting their directory numbers.

> **Note**   Cisco recommends you use auto-registration to add less than 100 phones to your network. To add more than 100 phones to your network, use the Bulk Administration Tool (BAT). See the "Adding Phones with BAT" section on page 2-10.

Auto-registration is disabled by default. In some cases, you might not want to use auto-registration; for example, if you want to assign a specific directory number to the phone. For information about enabling auto-registration, go to the "Enabling Auto-Registration" section in the *Cisco Unified Communications Manager Administration Guide.*

> **Note**   When you configure the cluster for mixed mode through the Cisco CTL client, auto-registration is automatically disabled. When you configure the cluster for non-secure mode through the Cisco CTL client, auto-registration is automatically enabled.

Related Topics

- Adding Phones with Auto-Registration and TAPS, page 2-9
- Adding Phones with Cisco Unified CM Administration, page 2-10
- Adding Phones with BAT, page 2-10

Adding Phones with Auto-Registration and TAPS

You can add phones with auto-registration and TAPS, the Tool for Auto-Registered Phones Support, without first gathering MAC addresses from phones.

TAPS works with the Bulk Administration Tool (BAT) to update a batch of phones that were already added to the Cisco Unified CM database with dummy MAC addresses. Use TAPS to update MAC addresses and download pre-defined configurations for phones.

> **Note**   Cisco recommends you use auto-registration and TAPS to add less than 100 phones to your network. To add more than 100 phones to your network, use the Bulk Administration Tool (BAT). See the "Adding Phones with BAT" section on page 2-10.

To implement TAPS, you or the end-user dial a TAPS directory number and follow voice prompts. When the process is complete, the phone will have downloaded its directory number and other settings, and the phone will be updated in Cisco Unified CM Administration with the correct MAC address.

Auto-registration must be enabled in Cisco Unified CM Administration (**System > Cisco Unified CM**) for TAPS to function.

> **Note**   When you configure the cluster for mixed mode through the Cisco CTL client, auto-registration is automatically disabled. When you configure the cluster for non-secure mode through the Cisco CTL client, auto-registration is automatically enabled.

For more information, go to the "Bulk Administration" chapter in *Cisco Unified Communications Manager Administration Guide.*

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Related Topics

- Adding Phones with Auto-Registration, page 2-8
- Adding Phones with Cisco Unified CM Administration, page 2-10
- Adding Phones with BAT, page 2-10

Adding Phones with Cisco Unified CM Administration

You can add phones individually to the Cisco Unified CM database by using Cisco Unified CM Administration. To do so, you first need to obtain the MAC address for each phone.

For information about determining a MAC address, see the "Determining the MAC Address for a Cisco Unified IP Phone" section on page 2-11.

After you have collected MAC addresses, in Cisco Unified CM Administration, choose **Device > Phone** and click **Add New** to begin.

For complete instructions and conceptual information about Cisco Unified CM, go to the "Cisco Unified Communications Manager Overview" chapter in the *Cisco Unified Communications Manager System Guide*.

Related Topics

- Adding Phones with Auto-Registration, page 2-8
- Adding Phones with Auto-Registration and TAPS, page 2-9
- Adding Phones with BAT, page 2-10

Adding Phones with BAT

Cisco Unified Communications Manager Bulk Administration Tool (BAT) enables you to perform batch operations, including registration, on multiple phones. To access BAT, choose **Bulk Administration** drop-down menu in Cisco Unified Communications Manager Administration,

To add phones by using BAT only (not in conjunction with TAPS), you can use the MAC address for each phone or dummy MAC addresses if you have a large number of new phones.

For information about determining a MAC address, see the "Determining the MAC Address for a Cisco Unified IP Phone" section on page 2-11.

For detailed instructions about using BAT, go to the "Bulk Administration" chapter in the *Cisco Unified Communications Manager Administration Guide*.

Related Topics

- Adding Phones with Auto-Registration, page 2-8
- Adding Phones with Auto-Registration and TAPS, page 2-9
- Adding Phones with Cisco Unified CM Administration, page 2-10

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Determining the MAC Address for a Cisco Unified IP Phone

Several procedures described in this manual require you to determine the MAC address of a Cisco Unified IP Phone. You can determine a phone's MAC address in these ways:

- From the phone, press the **Applications** button and select **Phone Information** and look at the MAC Address field.

- Look at the MAC label on the back of the phone.

- Display the web page for the phone and click the **Device Information** hyperlink.

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C H A P T E R **3**

Setting Up the Cisco Unified IP Phone

This chapter includes the following topics, which help you install the Cisco Unified IP Phone on an IP telephony network:

Note Before you install a Cisco Unified IP phone, you must decide how to configure the phone in your network. Then you can install the phone and verify its functionality. For more information, see Chapter 2, "Preparing to Install the Cisco Unified IP Phone on Your Network."

Before You Begin

Before installing the Cisco Unified IP Phone, review the requirements in these sections:

Network Requirements

For the Cisco Unified IP Phone to successfully operate as a Cisco Unified IP Phone endpoint in your network, your network must meet the following requirements:

- Working VoIP network:
    - VoIP configured on your Cisco routers and gateways
    - Cisco UnifiedCM installed in your network and configured to handle call processing
- IP network that supports DHCP or manual assignment of IP address, gateway, and subnet mask

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Note The Cisco Unified IP Phone displays the date and time from Cisco Unified CM. If the Cisco Unified CM server is located in a different time zone than the phones, the phones will not display the correct local time.

Cisco Unified Communications Manager Configuration

The Cisco Unified IP Phone requires Cisco Unified CM to handle call processing. Refer to *Cisco Unified Communications Manager Administration Guide* or to context-sensitive help in the Cisco Unified Communications Manager application to ensure that Cisco Unified CM is set up properly to manage the phone and to properly route and process calls.

If you plan to use auto-registration, verify that it is enabled and properly configured in Cisco Unified Communications Manager Administration before connecting any Cisco Unified IP Phone to the network. For information about enabling and configuring auto-registration, refer to *Cisco Unified Communications Manager Administration Guide*. Also, see the "Adding Phones to the Cisco Unified CM Database" section on page 2-8.

You must use Cisco Unified Communications Manager Administration to configure and assign telephony features to the Cisco Unified IP phones. See the "Telephony Features Available for the Cisco Unified IP Phone" section on page 5-1 for details.

In Cisco Unified Communications Manager Administration, you can add users to the database, add users to user groups, and associate users to specific phones. In this way, users gain access their Cisco Unified CM User Option page to configure items such as call forwarding, speed dialing, and voice messaging system options. See the "Adding Users to Cisco Unified Communications Manager" section on page 5-20 for details.

Understanding the Cisco Unified IP Phones 6921, 6941, and 6961 Components

The Cisco Unified IP Phone 6921, 6941, and 6961 include these components on the phone or as accessories for the phone:

- Network and Access Ports, page 3-2
- Handset, page 3-3
- Speakerphone, page 3-3
- Headset, page 3-3

Network and Access Ports

The back of the Cisco Unified IP Phone 6921, 6941, and 6961 includes these ports:

- Network port—Labeled network
- Access port—Labeled computer

Each port supports 10/100 Mbps half- or full-duplex connections to external devices. You can use either Category 3/5/5e cabling for 10-Mbps connections, but you must use Category 5/5e for 100-Mbps connections.

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Use the SW network port to connect the phone to the network. You must use a straight-through cable on this port. The phone can also obtain inline power from a switch over this connection. See the "Adding Phones to the Cisco Unified CM Database" section on page 2-8 for details.

Use the PC access port to connect a network device, such as a computer, to the phone. You must use a straight-through cable on this port.

Handset

The handset is designed especially for use with a Cisco Unified IP Phone. It includes a light strip that indicates incoming calls and voice messages waiting.

To connect a handset to the Cisco Unified IP Phone, plug the cable into the handset and the Handset port on the back of the phone.

Speakerphone

By default, the speakerphone is enabled on the Cisco Unified IP Phone.

You can disable the speakerphone by using Cisco Unified Communications Manager Administration. To do so, choose **Device > Phone** and locate the phone you want to modify. In the Phone Configuration window for the phone, check the **Disable Speakerphone** check box.

Headset

Although Cisco Systems performs internal testing of third-party headsets for use with the Cisco Unified IP Phones, Cisco Systems does not certify or support products from headset or handset vendors.

Cisco recommends the use of good quality external devices, for example, headsets that are screened against unwanted radio frequency (RF) and audio frequency (AF) signals. Depending on the quality of headsets and their proximity to other devices such as cell phones and two-way radios, some audio noise or echo may still occur. An audible hum or buzz may be heard by either the remote party or by both the remote party and the Cisco Unified IP Phone user. Humming or buzzing sounds can be caused by a range of outside sources; for example, electric lights, electric motors, or large PC monitors. See the "Using External Devices" section on page 3-4 for more information.

> **Note** In some cases, hum may be reduced or eliminated by using a local power cube or power injector.

These environmental and hardware inconsistencies in the locations where Cisco Unified IP Phones are deployed means that there is not a single headset solution that is optimal for all environments.

Cisco recommends that customers test headsets in their intended environment to determine performance before making a purchasing decision and deploying en masse.

Audio Quality

Beyond its physical, mechanical and technical performance, the audio portion of a headset must sound good to the user and to the party on the far end. Sound quality is subjective and Cisco cannot guarantee the performance of any headsets. However, a variety of headsets from leading headset manufacturers have been reported to perform well with Cisco Unified IP Phones.

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For information about wireless headsets that work in conjunction with the wireless headset remote hookswitch control feature, see:
http://www.cisco.com/en/US/partner/prod/voicesw/ucphone_headsets.html.

Connecting a Headset

To connect a wired headset to the Cisco Unified IP Phone, plug it into the Headset port on the back of the phone. Press the **Headset** button on the phone to place and answer calls using the headset.

You can use the wired headset with all of the features on the Cisco Unified IP Phone, including the Volume and Mute buttons. Use these buttons to adjust the ear piece volume and to mute the speech path from the headset microphone.

Disabling a Headset

You can disable the headset by using Cisco Unified Communications Manager Administration. If you do so, you also will disable the speakerphone.

To disable the headset from Cisco Unified Communications Manager Administration, choose **Device > Phone** and locate the phone that you want to modify. In the Phone Configuration window for the phone, check the **Disable Speakerphone and Headset** check box.

Using External Devices

The following information applies when you use external devices with the Cisco Unified IP Phone:

Cisco recommends the use of good quality external devices that are shielded (screened) against unwanted radio frequency (RF) and audio frequency (AF) signals.

Depending on the quality of these devices and their proximity to other devices such as mobile phones or two-way radios, some audio noise may still occur. In these cases, Cisco recommends that you take one or more of the following actions:

- Move the external device away from the source of the RF or AF signals.
- Route the external device cables away from the source of the RF or AF signals.
- Use shielded cables for the external device, or use cables with a better shield and connector.
- Shorten the length of the external device cable.
- Apply ferrites or other such devices on the cables for the external device.

Cisco cannot guarantee the performance of the system because Cisco has no control over the quality of external devices, cables, and connectors. The system will perform adequately when suitable devices are attached using good quality cables and connectors.

> ⚠ **Caution**   In European Union countries, use only external headsets that are fully compliant with the EMC Directive [89/336/EC].

Installing the Cisco Unified IP Phone

You must connect the Cisco Unified IP Phone to the network and to a power source before using it. See Figure 3-1 shows the connections for Cisco Unified IP phones 6921 and 6941, and Figure 3-2 shows the connections for a Cisco Unified IP Phone 6961.

> **Note** Before you install a phone, even if it is new, upgrade the phone to the current firmware image. Before using external devices, read the "Using External Devices" section on page 3-4 for safety and performance information.

To install a Cisco Unified IP Phone, perform the tasks described in Table 3-1.

Table 3-1   Installing the Cisco Unified IP Phone 6921, 6941, and 6961

Task	Purpose	Related Topics
1.	Connect the handset to the Handset port.	—
2.	Connect a headset to the Headset port. Optional. You can add a headset later if you do not connect one now.	See the "Headset" section on page 3-3 for supported headsets.
3.	Optional. Connect the power supply to the Cisco DC Adapter port.	See the "Adding Phones to the Cisco Unified CM Database" section on page 2-8 for guidelines.
4.	Connect a straight-through Ethernet cable from the switch to the network port labeled Network on the Cisco Unified IP Phone 6921, 6941, and 6961. Each Cisco Unified IP Phone ships with one Ethernet cable in the box. You can use either Category 3/5/5e cabling for 10-Mbps connections, but you must use Category 5/5e for 100 Mbps connections.	See the "Network and Access Ports" section on page 3-2 for guidelines.
5.	Connect a straight-through Ethernet cable from another network device, such as a desktop computer, to the access port labeled Computer on the Cisco Unified IP Phone 6921, 6941, and 6961. Optional. You can connect another network device later if you do not connect one now. You can use either Category 3/5/5e cabling for 10-Mbps connections, but you must use Category 5/5e for 100 Mbps connections.	See the "Network and Access Ports" section on page 3-2 for guidelines.

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Figure 3-1   Cisco Unified IP Phone 6921 and 6941 Cable Connections
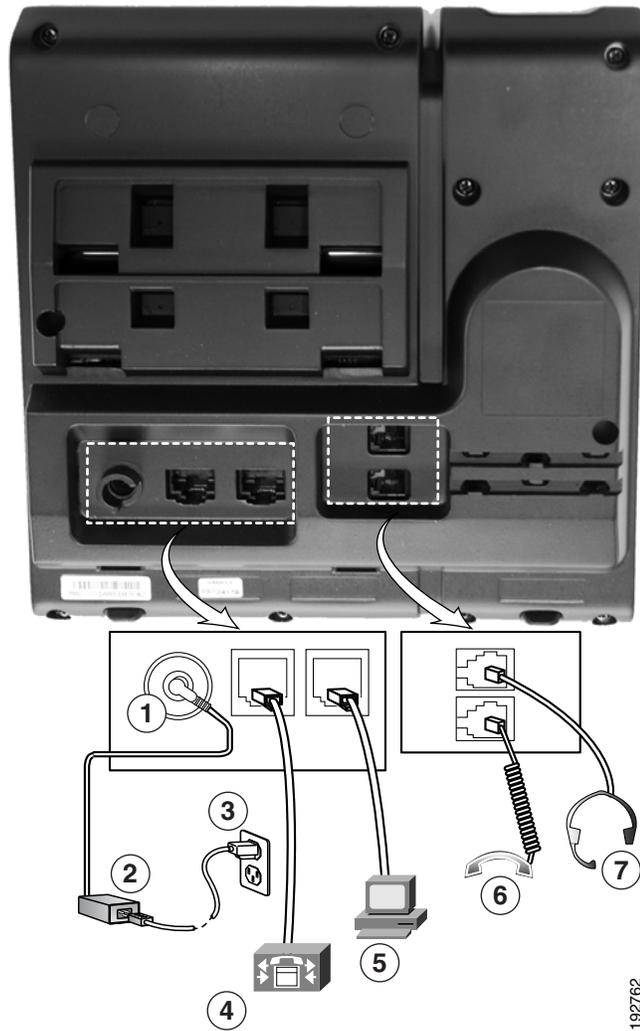
Figure 3-2   Cisco Unified IP Phone 6961 Cable Connections
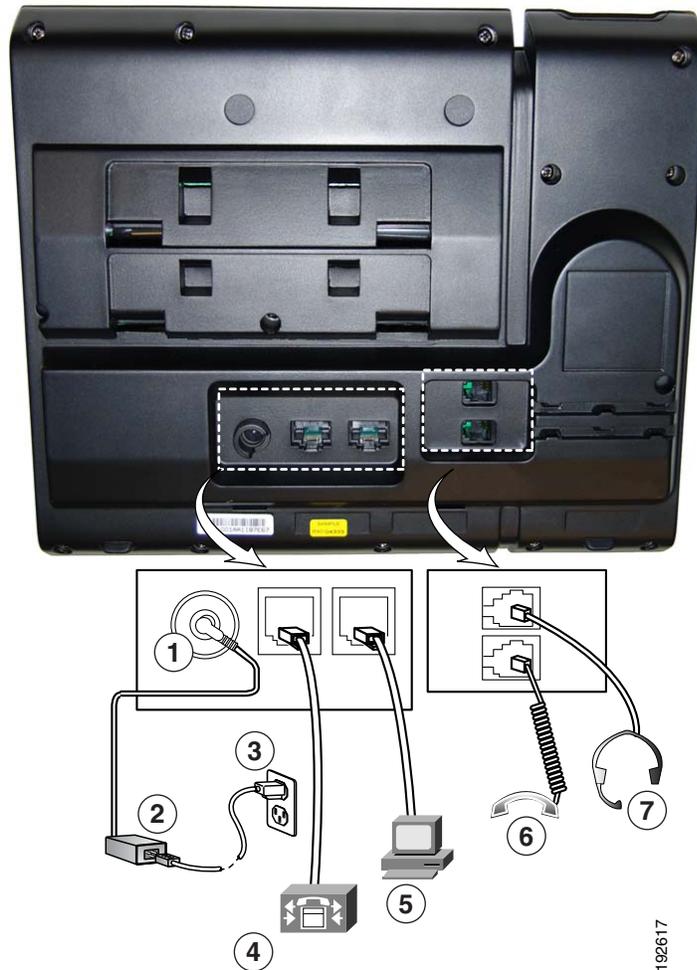
1	DC adaptor port (DC48V)	**5**	Access port (10/100 PC) connection
2	AC-to-DC power supply (optional)	**6**	Handset connection
3	AC power wall plus (optional)	**7**	Analog headset connection (optional)
4	Network port (10/100 SW) connection. IEEE 802.3af power enabled		

Related Topics

- Footstand, page 3-8
- Verifying the Phone Startup Process, page 3-12
- Configuring Startup Network Settings, page 3-13

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Reducing Power Consumption on the Phone

You can reduce the amount of energy that the Cisco Unified IP Phone 6921, 6941, and 6961 consumes by scheduling when the phone goes into power save mode. In power save mode, the backlight on the screen is not lit when the phone is not in use. The phone remains in power save mode for the scheduled duration or until the user lifts the handset or presses any button. In the Phone Configuration page on Cisco Unified Communications Administration, configure the following parameters.

- Days Backlight Not Active—Specify the days that the backlight remains inactive.
- Backlight on Time—Schedule the time of day that the backlight automatically activates. on the days listed in the off schedule.
- Backlight on Duration—Indicates the length of time that the backlight is active once the backlight is enabled by the programmed schedule
- Backlight Idle Timeout—Defines the period of user inactivity on the phone before the backlight is turned off.

Footstand

If your phone is placed on a table or desk, the footstand can be connected to the back of the phone for a higher or lower viewing angle, depending on your preference.

Figure 3-3 shows the footstand and the alignment of the tabs on the footstand with the two different sets of holes on the Cisco Unified IP phones 6921 and 6941. Figure 3-4 shows the footstand and the alignment of the tabs on the footstand with the two different sets of holes on the Cisco Unified IP Phone 6961.

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Figure 3-3   Cisco Unified IP Phone 6921 and 6941

1	Footstand slots for a higher viewing angle	2	Footstand slots for a lower viewing angle

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Figure 3-4   ***Cisco Unified IP Phone 6961***

| 1 | Footstand slots for a higher viewing angle | 2 | Footstand slots for a lower viewing angle |

Higher Viewing Angle

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Lower Viewing Angle

Mounting the Phone to the Wall

You can mount the Cisco Unified IP Phone on the wall by using special brackets available in a Cisco Unified IP Phone wall mount kit. For information on installing the wall mount kit, see Appendix E, "Installing the Wall Mount Kit for the Cisco Unified IP Phones 6921, 6941, and 6961" or Appendix F, "Cisco Unified IP Phone Non-Lockable Wall Mount."

Note   Wall mount kits are ordered separately from the phone.

Verifying the Phone Startup Process

After the Cisco Unified IP Phone has power connected to it, the phone begins its startup diagnostic process by cycling through the following steps.

1. The following LED buttons flash on and off during the various stages of bootup as the phone checks its hardware. See Table 3-2 for a list of the hardware test and the LED diagnostic status.

Table 3-2   *LED Diagnostic Status*

Hardware Test	MWI	Hold	Mute	Speaker
Power is Ready	On	On	On	On
Flash is Accessible	—	On	On	On
RAM Test Successful	—	—	On	On
Ethernet Test Successful	—	—	—	On

2. The screen displays the Cisco Systems, Inc., logo screen.

3. These messages appear as the phone starts up.

- **–** Configuring IP message
- **–** Registering

4. The home screen displays:

- **–** Current date and time
- **–** Primary directory number
- **–** Additional directory numbers and speed dial numbers, if configured (Only on Cisco Unified IP Phone 6961)
- **–** Softkeys

If the phone successfully passes through these stages, it has started up properly. If the phone does not start up properly, see the "Resolving Startup Problems" section on page 9-1.

Configuring Startup Network Settings

If you are not using DHCP in your network, you must configure these network settings on the Cisco Unified IP Phone after installing the phone on the network:

- **•** IP address
- **•** IP subnet information
- **•** TFTP server IP address
- **•** You also may configure the domain name and the DNS server settings, if necessary.

Collect this information and see the instructions in Chapter 4, "Configuring Settings on the Cisco Unified IP Phone."

Configuring Security on the Cisco Unified IP Phone

The security features protect against several threats, including threats to the identity of the phone and to data. These features establish and maintain secure communication streams between the phone and the Cisco Unified Communications Manager server, and digitally sign files before they are delivered.

For more information about the security features, see the "Understanding Security Features for Cisco Unified IP Phones" section on page 1-14. Also, refer to *Cisco Unified Communications Manager Security Guide*.

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You can initiate the installation of an LSC from the Security Configuration menu on the phone. This menu also lets you update or remove an LSC.

Before You Begin

Make sure that the appropriate Cisco Unified CM and the Certificate Authority Proxy Function (CAPF) security configurations are complete:

- The CTL file should have a CAPF certificate.
- On Cisco Unified Communications Operating System Administration, verify that the CAPF certificate has been installed.
- The CAPF is running and configured.

Refer to *Cisco Unified Communications Manager Security Guide* for more information.

To manually configure an LSC on the phone, perform these steps:

Procedure

Step 1   Obtain the CAPF authentication code that was set when the CAPF was configured.

Step 2   From the phone, choose **Applications > Admin Settings > Security Configuration**.

✎

Note   You can control access to the Administrator Settings Menu by using the Settings Access field in the Cisco Unified Communications Manager Administration Phone Configuration window. For more information, see the *Cisco Unified Communications Manager Administration Guide*.

Step 3   To unlock settings, see the "Unlocking and Locking Options" section on page 4-3.

Step 4   Scroll to LSC and press the **Update** softkey.

The phone prompts for an authentication string.

Step 5   Enter the authentication code and press the **Submit** softkey.

The phone begins to install, update, or remove the LSC, depending on how the CAPF was configured. During the procedure, a series of messages appears in the LSC option field in the Security Configuration menu, so you can monitor progress.

The LSC install, update, or removal process can take a long time to complete. You can stop the process at any time by pressing the **Stop** softkey from the Security Configuration menu. (Settings must be unlocked before you can press this softkey.)

You can verify that an LSC is installed on the phone by choosing **Administrator Settings > Phone Information** and ensuring that the LSC setting shows Installed.

Related Topic

Understanding Security Features for Cisco Unified IP Phones, page 1-14

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Configuring Settings on the Cisco Unified IP Phone

The Cisco Unified IP Phone includes many configurable network settings that you may need to modify before the phone is functional for your users. You can access these settings, and change some of them, through menus on the phone. Settings that are display-only on the phone are configured in Cisco Unified CM Administration.

This chapter includes the following topics:

- Configuration Menus on the Cisco Unified IP Phone, page 4-1
- Network Setup Menu, page 4-4
- IPv4 Setup Menu Options, page 4-6
- Security Configuration Menu, page 4-8

Configuration Menus on the Cisco Unified IP Phone

The Cisco Unified IP Phone includes the following configuration menus:

- Network Setup—Provides options for viewing and making a variety of network settings. For more information, see the "Network Setup Menu" section on page 4-4.
- IPv4 Configuration—A sub-menu of the Network Setup menu, the IPv4 menu items provide additional network options for viewing and setting. For more information, see the "IPv4 Setup Menu Options" section on page 4-6.

Before you can change option settings on the Network Setup menu, you must unlock options for editing. See the "Unlocking and Locking Options" section on page 4-3 for instructions.

For information about the keys you can use to edit or change option settings, see the "Editing Values" section on page 4-3.

You can control whether a phone user has access to phone settings by using the Settings Access field in the Cisco Unified CM Administration Phone Configuration window.

Related Topics

- Displaying a Configuration Menu, page 4-2
- Unlocking and Locking Options, page 4-3
- Editing Values, page 4-3
- Network Setup Menu, page 4-4

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- IPv4 Setup Menu Options, page 4-6

Displaying a Configuration Menu

To display a configuration menu, perform the following steps.

> **Note** You can control whether a phone has access to the Settings menu or to options on this menu by using the Settings Access field in the Cisco Unified CM Administration Phone Configuration window. The Settings Access field accepts these values:
>
> - **Enabled**—Allows access to the Settings menu.
> - **Disabled**—Prevents access to the Settings menu.
> - **Restricted**—Allows access to the User Preferences menu and allows volume changes to be saved. Prevents access to other options on the Settings menu.
>
> If you cannot access an option on the Administrator Settings menu, check the Settings Access field.

Procedure

Step 1 Press the **Applications** button.

Step 2 Select **Admin Settings**.

> **Note** For information about the Status menu, see Chapter 7, "Viewing Model Information, Status, and Statistics on the Cisco Unified IP Phone." For information about the Reset Settings menu, see Chapter 9, "Troubleshooting and Maintenance."

Step 3 Enter the password and then press the **Select** button. The Admin Settings password is configured in the Local Phone Unlock Password parameter in the Common Phone Profile Configuration on Cisco Unified CM Administration.

> **Note** Users can access the Admin Settings without entering a password when the Local Phone Unlock Password parameter is not configured

Step 4 Perform one of these actions to display the desired menu:

- Use the navigation bar to select the desired menu and then press the **Select** button.
- Use the keypad on the phone to enter the number that corresponds to the menu.

Step 5 To display a submenu repeat Step 4.

Step 6 To exit a menu, press the **Exit** softkey.

Related Topics

- Unlocking and Locking Options, page 4-3
- Editing Values, page 4-3

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Unlocking and Locking Options

You can apply a password to the phone so that no changes can be made to the administrative options on the phone without the password being entered on the Admin Settings phone screen.

To apply a password to the phone, in Cisco Unified CM administration, navigate to the Common Phone Profile Configuration window (**Device > Device Settings > Common Phone Profile**). Enter a password in the Local Phone Unlock Password option. Apply the password to the common phone profile that the phone uses.

Related Topics

Editing Values

When you edit the value of an option setting, follow these guidelines:

- Use the keys on the keypad to enter numbers and letters.
- To enter letters by using the keypad, use a corresponding number key. Press the key one or more times to display a particular letter. For example, press the **2** key once for "a," twice quickly for "b," and three times quickly for "c." After you pause, the cursor automatically advances to allow you to enter the next letter.
- To enter a period (for example, in an IP address), press * on the keypad.
- Press the up arrow on the navigation bar to move the cursor to the left most character, and press the down arrow on the navigation bar to move the cursor to the right most character.
- Press ⊗ if you make a mistake. This softkey deletes the character to the left of the cursor.
- Press the **Cancel** softkey before pressing the **Save** softkey to discard any changes that you have made.

> **Note**   The Cisco Unified IP Phone provides several methods you can use to reset or restore option settings, if necessary. For more information, see the "Resetting or Restoring the Cisco Unified IP Phone" section on page 9-12.

Related Topics

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Network Setup Menu

The Network Setup menu provides options for viewing and making a variety of network settings. Table 4-1 describes these options and, where applicable, explains how to change them.

For information about how to access the Network Setup menu, see the .

For information about the keys you can use to edit options, see the .

Table 4-1   Network Setup Menu Options

Option	Description	To Change
IPv4 Setup	In the IPv4 Setup submenu, you can do the following: • Enable or disable the phone to use the IP address that is assign by the DHCP server. • Manually set the IP Address, Subnet Mask, Default Routers, DNS Server, and Alternate TFTP servers. For more information on the IPv4 address fields, refer to Table 4-2.	Scroll to IPv4 Setup and press **Select**.
Host Name	Unique host name that the DHCP server assigned to the phone.	Display only—Cannot configure.
Domain Name	Name of the Domain Name System (DNS) domain in which the phone resides.	1. Set the DHCP Enabled option to **No**. 2. Scroll to the Domain Name option, press the **Edit** softkey, and then enter a new domain name. 3. Press the **Apply** softkey, then press **Save**.
Operational VLAN ID	Auxiliary Virtual Local Area Network (VLAN) configured on a Cisco Catalyst switch in which the phone is a member. If the phone has not received an auxiliary VLAN, this option indicates the Administrative VLAN. If neither the auxiliary VLAN nor the Administrative VLAN are configured, this option defaults to a VLAN ID of 4095.	Display only—Cannot configure. The phone obtains its Operational VLAN ID via Cisco Discovery Protocol (CDP) from the switch to which the phone is attached. To assign a VLAN ID manually, use the Admin VLAN ID option.
Admin. VLAN ID	Auxiliary VLAN in which the phone is a member. Used only if the phone does not receive an auxiliary VLAN from the switch; otherwise it is ignored.	1. Scroll to the Admin. VLAN ID option, press the **Edit** softkey, and then enter a new Admin VLAN setting. 2. Press the **Apply** softkey, then press **Save**.

Table 4-1   Network Setup Menu Options (continued)

Option	Description	To Change
PC VLAN	Allows the phone to interoperate with 3rd party switches that do not support a voice VLAN. The Admin VLAN ID option must be set before you can change this option.	1. Make sure the Admin VLAN ID option is set. 2. Scroll to the **PC VLAN** option, press the **Edit** softkey, and then enter a new PC VLAN setting. 3. Press the **Apply** softkey, then press **Save**.
SW Port Configuration	Speed and duplex of the network port. Valid values: • Auto Negotiate • 100 Half—100-BaseT/half duplex • 100 Full—100-BaseT/full duplex • 10 Half—10-BaseT/half duplex • 10 Full—10-BaseT/full duplex If the phone is connected to a switch, configure the port on the switch to the same speed/duplex as the phone, or configure both to auto-negotiate. If you change the setting of this option, you must change the PC Port Configuration option to the same setting.	1. Unlock network setup options. 2. Scroll to the SW Port Configuration option and then press the **Edit** softkey. 3. Scroll to the setting that you want and then press the **Select** button.
PC Port Configuration	Speed and duplex of the access port. Valid values: • Auto Negotiate • 100 Half—100-BaseT/half duplex • 100 Full—100-BaseT/full duplex • 10 Half—10-BaseT/half duplex • 10 Full—10-BaseT/full duplex If the phone is connected to a switch, configure the port on the switch to the same speed/duplex as the phone, or configure both to auto-negotiate. If you change the setting of this option, you must change the SW Port Configuration option to the same setting.	1. Unlock network setup options. 2. Scroll to the PC Port Configuration option and then press the **Edit** softkey. 3. Scroll to the setting that you want and then press the **Select** button.
LLDP-MED: Switch Port	Enables and disables Link Layer Discovery Protocol Media Endpoint Discovery (LLDP-MED) on the switch port. Use this setting to force the phone to use a specific discovery protocol, which should match the protocol supported by the switch. Settings include: • Enabled—default • Disabled	From Cisco Unified CM Administration, choose **Device > Phone > Phone Configuration**.

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IPv4 Setup Menu Options

The IPv4 Setup menu is a submenu of the Network Setup menu. To reach the IPv4 Setup menu, select the IPv4 option on the Network Setup menu.

Table 4-2 describes the IPv4 Setup menu options.

For information about the keys you can use to edit options, see the .

Table 4-2   IPv4 Setup Menu Options

Option	Description	To Change
DHCP	Indicates whether the phone has DHCP enabled or disabled. When DHCP is enabled, the DHCP server assigns the phone an IP address. When DHCP is disabled, the administrator must manually assign an IP address to the phone.	Scroll to the DHCP option, press the **Edit** softkey, then press either the **No** softkey to disable DHCP, or press the **Yes** softkey to enable DHCP.
IP Address	Internet Protocol (IP) address of the phone. If you assign an IP address with this option, you must also assign a subnet mask and default router. See the Subnet Mask and Default Router options in this table.	1. Set the DHCP option to **No**. 2. Scroll to the IP Address option, press the **Edit** softkey, and then enter a new IP Address. 3. Press the **Apply** softkey, then press **Save**.
Subnet Mask	Subnet mask used by the phone.	1. Set the DHCP Enabled option to No. 2. Scroll to the Subnet Mask option, press the **Edit** softkey, and then enter a new subnet mask. 3. Press the **Apply** softkey, then press **Save**.
Default Router 1	Default router used by the phone (Default Router 1).	1. Set the DHCP Enabled option to No. 2. Scroll to the appropriate Default Router option, press the **Edit** softkey, and then enter a new router IP address. 3. Press the **Apply** softkey, then press **Save**.
DNS Server 1	Primary Domain Name System (DNS) server (DNS Server 1) and optional backup DNS servers (DNS Server 2–5) used by the phone.	1. Set the DHCP Enabled option to No. 2. Scroll to the appropriate DNS Server option, press the **Edit** softkey, and then enter a new DNS server IP address. 3. Press the **Apply** softkey, then press **Save**.

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Table 4-2   IPv4 Setup Menu Options (continued)

Option	Description	To Change
Alternate TFTP	Indicates whether the phone is using an alternative TFTP server.	Scroll to the Alternate TFTP option and press the **Yes** softkey if the phone should use an alternative TFTP server; press the **No** softkey if the phone should not use an alternative TFTP server.
TFTP Server 1	Primary Trivial File Transfer Protocol (TFTP) server used by the phone. If you are not using DHCP in your network and you want to change this server, you must use the TFTP Server 1 option. If you set the Alternate TFTP option to yes, you must enter a non-zero value for the TFTP Server 1 option.	1. If DHCP is enabled, set the Alternate TFTP option to **Yes**. 2. Scroll to the TFTP Server 1 option, press the **Edit** softkey, and then enter a new TFTP server IP address. 3. Press the **Apply** softkey, then press **Save**.
TFTP Server 2	Optional backup TFTP server that the phone uses if the primary TFTP server is unavailable.	1. Enter an IP address for the TFTP Server 1 option. 2. Scroll to the TFTP Server 2 option, press the **Edit** softkey, and then enter a new backup TFTP server IP address. 3. Press the **Apply** softkey, then press **Save**.
DHCP Address Released	Releases the IP address assigned by DHCP.	Scroll to the DHCP Address Released option and press the **Edit** softkey, then press the **Yes** softkey to release the DHCP Address.

Related Topics

- Displaying a Configuration Menu, page 4-2

- Unlocking and Locking Options, page 4-3

- Editing Values, page 4-3

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Security Configuration Menu

The Security Configuration menu provides information about various security settings. It provides access to the Trust List File screen and the 802.1x authentication.

Table 4-3 describes the options in this menu.

Table 4-3   Security Menu Settings

Option	Description	To Change
Security Mode	Displays the security mode that is set for the phone.	From Cisco Unified CM Administration, choose **Device > Phone > Phone Configuration**.
LSC	Indicates if a locally significant certificate (used for the security features) is installed on the phone (Installed) or is not installed on the phone (Not Installed).	For information about how to manage the LSC for your phone, refer to the "Using the Certificate Authority Proxy Function" chapter in *Cisco Unified Communications Manager Security Guide*.
CTL	Indicates if the CTL has been installed.	Display only—Cannot configure.
Trust List	The Trust List provides submenus for a list of trusted servers, CAPF servers, and Call Manager/TFTP Server.	For more information, see the "Trust List Menu" section on page 4-8.
802.1X Authentication	Displays the device authentication, EAP/MD5, and transaction status.	See the "802.1X Authentication and Status" section on page 4-9.

Trust List Menu

The Trust List menu displays information about all of the servers that the phone trusts and includes the options described in Table 4-4.

To exit the Trust List menu, press the back softkey.

Table 4-4   Trust List Menu Settings

Option	Description	To Change
CTL Signature	Displays the MD5 hash of the CTL file.	For more information about this file, go to Configuring the Cisco CTL Client in *Cisco Unified Communications Manager Security Guide*.
CAPF Server	Common Name (from the Cisco Unified CM Certificate) of the CAPF server used by the phone. Displays a Certified icon if the server is an authenticated server	For more information about this file, go to Configuring the Cisco CTL Client in *Cisco Unified Communications Manager Security Guide*.

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Table 4-4   *Trust List Menu Settings (continued)*

Option	Description	To Change
Unified CM/TFTP Server	Common Name (from the Cisco Unified CM Certificate) of a Cisco Unified CM and the TFTP server used by the phone. Displays a Certified icon if the server is an authenticated server	For more information about this file, go to Configuring the Cisco CTL Client in the *Cisco Unified Communications Manager Security Guide*.
SRST Router	Common Name (from the Cisco Unified CM Certificate) of the trusted SRST router that is available to the phone, if such a device has been configured in Cisco Unified CM Administration. Displays a Certified icon if the server is an authenticated server	For more information about this file, go to Configuring the Cisco CTL Client in the *Cisco Unified Communications Manager Security Guide*.

802.1X Authentication and Status

The 802.1X Authentication and 802.1X Authentication Status menus allow you to enable 802.1X authentication and view transaction status. These options are described in Table 4-5.

To exit these menus, press the **Exit** softkey.

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Table 4-5   802.1X Authentication Settings

Option	Description	To Change
Device Authentication	Determines whether 802.1X authentication is enabled: • **Enabled**—Phone uses 802.1X authentication to request network access. • **Disabled**—Default setting in which the phone uses CDP to acquire VLAN and network access.	1. Choose **Applications > Admin Settings > Security Config > 802.1X Authentication > Device Authentication**. 2. Press **Edit** softkey. 3. Set the Device Authentication option to Enabled or Disabled. 4. Press the **Save** softkey.
EAP-MD5	Device ID—A derivative of the phone's model number and unique MAC address displayed in this format: CP-*<model>*-SEP-*<MAC>*	1. Choose **Applications > Admin Settings > Security Config > 802.1X Authentication > EAP/MD5 > Device ID**. 2. Press the **Edit** softkey**.** 3. Set the Device ID. 4. Press the **Save** softkey.
	Shared Secret—Choose a password to use on the phone and on the authentication server. The password must be between 6 and 32 characters, consisting of any combination of numbers or letters. **Note** If you disable 802.1X authentication or perform a factory reset of the phone, the shared secret is deleted.	1. Choose **Applications > Admin Settings > Security Config > 802.1X Authentication > EAP-MD5 > Shared Secret**. 2. Press the **Edit** softkey**.** 3. Enter the shared secret. 4. Press the **Save** softkey. See the "Troubleshooting Cisco Unified IP Phone Security" section on page 9-8 for assistance in recovering from a deleted shared secret.
	Realm—Indicates the user network domain, always set as *Network*.	1. Choose **Applications > Admin Settings > Security Config > 802.1X Authentication > EAP-MD5 > Realm**. 2. Press the **Edit** softkey**.** 3. Enter the Network. 4. Press the **Save** softkey.
Transaction Status	Displays the transaction status of your 802.1X Authentication.	To view the transaction status of your 802.1X Authentication, choose **Applications > Admin Settings > Security Configuration > 802.1X Authentication Status**.

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Configuring Features, Templates, Services, and Users

After you install Cisco Unified IP Phones in your network, configure their network settings, and add them to Cisco Unified CM, you must use the Cisco Unified Communications Manager Administration application to configure telephony features, optionally modify phone templates, set up services, and assign users.

This chapter provides an overview of these configuration and setup procedures. The Cisco Unified CM documentation provides detailed instructions for these procedures.

To list supported features for all phones or for a particular phone model on your Cisco Unified Communications Manager, you can generate a Unified CM Phone Feature List report on Cisco Unified Reporting.

For suggestions about how to provide users with information about features, and what information to provide, see Appendix A, "Providing Information to Users Via a Website."

For information about setting up phones in non-English environments, see Appendix C, "Technical Specifications."

This chapter includes following topics:

- Telephony Features Available for the Cisco Unified IP Phone, page 5-1
- Join and Direct Transfer Policy, page 5-14
- Modifying Phone Button Templates, page 5-16
- Configuring Softkey Templates, page 5-18
- Setting Up Services, page 5-19
- Adding Users to Cisco Unified Communications Manager, page 5-20
- Managing the User Options Web Pages, page 5-21

Telephony Features Available for the Cisco Unified IP Phone

After you add Cisco Unified IP Phones to Cisco Unified Communications Manager, you can add functionality to the phones. Table 5-1 includes a list of supported telephony features, many of which you can configure using Cisco Unified Communications Manager Administration. The Reference column lists Cisco Unified Communications Manager and other documentation that contains configuration procedures and related information.

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For information about using most of these features on the phone, refer to *Cisco Unified IP Phone 6921, 6941, and 6961 User Guide for Cisco Unified Communications Manager 8.0.*

> **Note**   Cisco Unified Communications Manager Administration also provides several service parameters that you can use to configure various telephony functions. For more information on accessing and configuring service parameters, refer to *Cisco Unified Communications Manager Administration Guide.*
>
> For more information on the functions of a service, select the name of the parameter or the question mark help button in the Service Parameter Configuration window.

Table 5-1   Telephony Features for the Cisco Unified IP Phone

Feature	Description	Configuration Reference
Abbreviated dialing	Allows users to speed dial a phone number by entering an assigned index code (1-99) on the phone keypad. **Note** You can use Abbreviated Dialing while on-hook or off-hook. Users assign index codes from the User Options web pages.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Configuration. • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone.
Any Call Pickup	Allows users to pick up a call on any line in their call pickup group, regardless of how the call was routed to the phone.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, "Call Pickup Configuration."
Audible Message Waiting Indicator (AMWI)	A stutter tone from the handset, headset, or speakerphone indicates that a user has one or more new voice messages on a line. **Note** The stutter tone is line-specific. You hear it only when using the line with the waiting messages.	For more information, see the *Cisco Unified Communications Manager System Guide*, Cisco Unified IP Phone.
Auto Answer	Connects incoming calls automatically after a ring or two. Auto Answer works with either the speakerphone or the headset.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, Directory Number Configuration.
Auto-pickup	Allows a user to use one-touch pickup functionality for call pickup features.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Pickup.
Block external to external transfer	Prevents users from transferring an external call to another external number.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, External Call Transfer Restrictions.
Busy Lamp Field (BLF)	Allows a user to monitor the call state of a directory number associated with a speed-dial button on the phone.	For more information, go to the *Cisco Unified Communications Manager Features and Services Guide*, Presence.

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Table 5-1 Telephony Features for the Cisco Unified IP Phone (continued)

Feature	Description	Configuration Reference
Busy Lamp Field (BLF) Pickup	Provides enhancements to BLF speed dial. Allows you to configure a Directory Number (DN) that a user can monitor for incoming calls. When the DN receives an incoming call, the system alerts the monitoring user, who can then pick up the call.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Pickup.
Call Back	Provides users with an audio and visual alert on the phone when a busy or unavailable party becomes available.	For more information, see the following: • *Cisco Unified Communications Manager System Guide*, Cisco Unified IP Phone. • *Cisco Unified Communications Manager Features and Services Guide*, Cisco Call Back.
Call display restrictions	Determines the information that will display for calling or connected lines, depending on the parties who are involved in the call.	For more information, refer to: • *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Configuration. • *Cisco Unified Communications Manager System Guide,* Understanding Route Plans. • *Cisco Unified Communications Manager Features and Services Guide,* Call Display Restrictions.
Call Forward	Allows users to redirect incoming calls to another number. Call forward options include Call Forward All, Call Forward Busy, Call Forward No Answer, and Call Forward No Coverage.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide,* Directory Number Configuration. • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone. • "Specifying Options that Appear on the User Options Web Pages" section on page 5-22
Call forward all loop breakout	Detects and prevents Call Forward All loops. When a Call Forward All loop is detected, the Call Forward All configuration is ignored and the call rings through.	For more information, see the *Cisco Unified Communications Manager System Guide*, Cisco Unified IP Phone.
Call forward all loop prevention	Prevents a user from configuring a Call Forward All destination directly on the phone that creates a Call Forward All loop or that creates a Call Forward All chain with more hops than the existing *Forward Maximum Hop Count* service parameter allows.	For more information, see the *Cisco Unified Communications Manager System Guide*, Cisco Unified IP Phone.

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Table 5-1   ***Telephony Features for the Cisco Unified IP Phone (continued)***

Feature	Description	Configuration Reference
Call forward configurable display	Allows you to specify information that appears on a phone when a call is forwarded. This information can include the caller name, caller number, redirected number, and original dialed number.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide,* Directory Number Configuration. • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone..
Call forward destination override	Allows you to override Call Forward All (CFA) in cases where the CFA target places a call to the CFA initiator. This feature allows the CFA target to reach the CFA initiator for important calls. The override works whether the CFA target phone number is internal or external.	For more information, see the *Cisco Unified Communications Manager System Guide*, Understanding Directory Numbers.
Call park	Allows users to park (temporarily store) a call and then retrieve the call by using another phone in the Cisco Unified Communications Manager system.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Park and Directed Call Park.
Call pickup	Allows users to redirect a call that is ringing on another phone within their pickup group to their phone. You can configure an audio and/or visual alert for the primary line on the phone. This alert notifies the users that a call is ringing in their pickup group.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Pickup.
Call recording	Allows a supervisor to record an active call. The user might hear a recording audible alert tone during a call when it is being recorded. When a call is secured, the security status of the call is displayed as a lock icon on Cisco Unified IP Phones. The connected parties might also hear an audible alert tone that indicates the call is secured and is being recorded. **Note** When an active call is being monitored or recorded, you can receive or place intercom calls; however, if you place an intercom call, the active call will be put on hold, which causes the recording session to terminate and the monitoring session to suspend. To resume the monitoring session, the party whose call is being monitored must resume the call.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Monitoring and Recording.
Call waiting	Indicates (and allows users to answer) an incoming call that rings while on another call. Incoming call information appears on the phone display.	For more information, refer to: • *Cisco Unified Communications Manager System Guide,* Understanding Directory Numbers. • "Configuring the Phone to Support Call Waiting" section on page 5-23

Table 5-1   *Telephony Features for the Cisco Unified IP Phone (continued)*

Feature	Description	Configuration Reference
Caller ID	Caller identification such as a phone number, name, or other descriptive text appear on the phone display.	For more information, refer to: • *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Configuration. • *Cisco Unified Communications Manager System Guide,* Understanding Route Plans. • *Cisco Unified Communications Manager Features and Services Guide,* Call Display Restrictions. • *Cisco Unified Communications Manager Administration Guide,* Directory Number Configuration.
Caller ID Blocking	Allows a user to block their phone number or e-mail address from phones that have caller identification enabled.	For more information, refer to: • *Cisco Unified Communications Manager System Guide,* Understanding Route Plans. • *Cisco Unified Communications Manager Administration Guide,* Directory Number Configuration.
cBarge	Allows a user to join a non-private call on a shared phone line. cBarge adds a user to a call and converts it into a conference, allowing the user and other parties to access conference features	For more information, refer to: • *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Configuration. • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone. • *Cisco Unified Communications Manager Features and Services Guide,* Barge and Privacy.
Cisco Extension Mobility	Allows users to temporarily access their Cisco Unified IP Phone configuration such as line appearances, services, and speed dials from shared Cisco Unified IP Phone by logging into the Cisco Extension Mobility service on that phone when they log into the Cisco Extension Mobility service on that phone. Cisco Extension Mobility can be useful if users work from a variety of locations within your company or if they share a workspace with coworkers.	For more information, go to the "Cisco Extension Mobility" chapter in the *Cisco Unified Communications Manager Features and Services Guide*.

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Table 5-1   Telephony Features for the Cisco Unified IP Phone (continued)

Feature	Description	Configuration Reference
Cisco Extension Mobility Cross Cluster	Enables a user configured in one cluster to log into a Cisco Unified IP Phone in another cluster. Users from a home cluster log into a Cisco Unified IP Phone at a visiting cluster. **Note** Configure Cisco Extension Mobility on Cisco Unified IP Phones before you configure EMCC.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Cisco Extension Mobility Cross Cluster.
Cisco Unified Video Advantage (CUVA)	Allows users to make video calls by using your Cisco Unified IP Phone, your personal computer, and an external video camera. **Note** Configure Video Capabilities and Auto Line Select parameter in the Product Specific Configuration Layout section in Phone Configuration.	
Cisco Web Dialer	Allows users to make calls from web and desktop applications.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide,* Cisco Web Dialer.
Client matter codes (CMC)	Enables a user to specify that a call relates to a specific client matter.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Client Matter Codes and Forced Authorization Codes.
Conference	• Allows a user to talk simultaneously with multiple parties by calling each participant individually. Conference features include Conference and Meet-Me. • Allows a non-initiator in a standard (ad hoc) conference to add or remove participants; also allows any conference participant to join together two standard conferences on the same line.	The service parameter, Advance Adhoc Conference, (disabled by default in Cisco Unified CM Administration) allows you to enable these features. For information on conferences, see the *Cisco Unified Communications Manager System Guide*, Conference Bridges. For more information, see the *Cisco Unified Communications Manager System Guide*, Cisco Unified IP Phone. **Note** Be sure to inform your users whether these features are activated.
CTI Applications	A computer telephony integration (CTI) route point can designate a virtual device to receive multiple, simultaneous calls for application-controlled redirection.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, CTI Route Point Configuration.
Direct transfer	Allows users to connect two calls to each other (without remaining on the line).	For more information, see the *Cisco Unified Communications Manager System Guide*, Cisco Unified IP Phone.

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Table 5-1   Telephony Features for the Cisco Unified IP Phone (continued)

Feature	Description	Configuration Reference
Directed Call Park	Allows a user to transfer an active call to an available directed call park number that the user dials or speed dials. A Call Park BLF button indicates whether a directed call park number is occupied and provides speed-dial access to the directed call park number. **Note** If you implement Directed Call Park, avoid configuring the Park softkey. This prevents users from confusing the two Call Park features.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Park and Directed Call Park.
Directed Call Pickup	Allows a user to answer a call that is ringing on a particular directory number.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Pickup.
Distinctive ring	Users can customize how their phone indicates an incoming call and a new voice mail message.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Pickup.
Divert	Allows a user to transfer a ringing, connected, or held call directly to a voice-messaging system. When a call is diverted, the line becomes available to make or receive new calls.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Immediate Divert.
Do Not Disturb (DND)	When DND is turned on, either no audible rings occur during the ringing-in state of a call, or no audible or visual notifications of any type occur. You can configure the phone to have a softkey template with a DND softkey or a phone-button template with DND as one of the selected features. The following DND-related parameters are configurable in Cisco Unified Communications Manager Administration: • Do Not Disturb—This check box allows you to enable DND on a per-phone basis. Use **Cisco Unified Communications Manager Administration > Device > Phone > Phone Configuration**. • DND Incoming Call Alert—Choose the type of alert to play, if any, on a phone for incoming calls when DND is active. This parameter is located on both the Common Phone Profile page and the Phone configuration page (Phone Configuration window value takes precedence). • BLF Status Depicts DND—Enables DND status to override busy/idle state.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Do Not Disturb.

Table 5-1   ***Telephony Features for the Cisco Unified IP Phone (continued)***

Feature	Description	Configuration Reference
Fast Dial Service	Allows a user to enter a Fast Dial code to place a call. Fast Dial codes can be assigned to phone numbers or Personal Address Book entries. (See "Services" in this table.)	For more information, see Modifying a Phone Button Template for Personal Address Book or Speed Dials, page 5-16.
Forced authorization codes (FAC)	Controls the types of calls that certain users can place.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide,* Client Matter Codes and Forced Authorization Codes.
Group call pickup	Allows a user to answer a call that is ringing on a directory number in another group.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Pickup.
Hold Reversion	Limits the amount of time that a call can be on hold before reverting back to the phone that put the call on hold and alerting the user. Reverting calls are distinguished from incoming calls by a single ring (or beep, depending on the new call indicator setting for the line). This notification repeats at intervals if not resumed. A call that triggers Hold Reversion also displays an animated icon in the call bubble. You can configure call focus priority to favor incoming or reverting calls.	For more information about configuring this feature, see the *Cisco Unified Communications Manager Features and Services Guide*, Hold Reversion.
Hold Status	Enables phones with a shared line to distinguish between the local and remote lines that placed a call on hold.	No configuration is required.
Hold/Resume	Allows the user to move a connected call from an active state to a held state.	• Requires no configuration, unless you want to use music on hold. See "Music-on-Hold" in this table for information. • See "Hold Reversion" in this table.
Hunt Group	Provides load sharing for calls to a main directory number. A hunt group contains a series of directory numbers that can answer the incoming calls. When the first directory number in the hunt group is busy, the system hunts in a predetermined sequence for the next available directory number in the group and directs the call to that phone.	For more information, see the following: • *Cisco Communications Manager Administration Guide,* Hunt Group Configuration. • *Cisco Unified Communications Manager System Guide,* Understanding Route Plans.

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Table 5-1 *Telephony Features for the Cisco Unified IP Phone (continued)*

Feature	Description	Configuration Reference
Intercom	Allows users to place and receive intercom calls using programmable phone buttons. You can configure intercom line buttons to: • Directly dial a specific intercom extension. • Initiate an intercom call and then prompt the user to enter a valid intercom number. **Note** If your user logs into the same phone on a daily basis using their Cisco Extension Mobility profile, assign the phone button template that contains intercom information to their profile, and assign the phone as the default intercom device for the intercom line.	For more information, see the *Cisco Unified Communications Manager Feature and Services Guide*, Intercom.
Join Across Lines	Allows users to combine calls that are on multiple phone lines to create a conference call.	Some JTAPI/TAPI applications are not compatible with the Join and Direct Transfer feature implementation on the Cisco Unified IP Phone 6921, 6941, and 6961 and you may need to configure the Join and Direct Transfer Policy to disable join and direct transfer on the same line or possibly across lines. For more information, see the "Join and Direct Transfer Policy" section on page 5-14. For more information, see the *Cisco Unified Communications Manager System Guide*, Cisco Unified IP Phone.
Join	Allows users to combine two calls that are on one line to create a conference call and remain on the call.	Some JTAPI/TAPI applications are not compatible with the Join and Direct Transfer feature implementation on the Cisco Unified IP Phone 6921, 6941, and 6961 and you may need to configure the Join and Direct Transfer Policy to disable join and direct transfer on the same line or possibly across lines. For more information, see the "Join and Direct Transfer Policy" section on page 5-14. For more information: • Refer to *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone" • *Cisco Unified IP Phone 6921,6941, and 6961 User Guide*, "Basic Call Handling" chapter, "Making Conference Calls" section

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Table 5-1 ***Telephony Features for the Cisco Unified IP Phone (continued)***

Feature	Description	Configuration Reference
Log out of hunt groups	Allows users to log out of a hunt group and temporarily block calls from ringing their phone when they are not available to take calls. Logging out of hunt groups does not prevent non-hunt group calls from ringing their phone.	For more information: • See the "Configuring Softkey Templates" section on page 5-18. • *Cisco Unified Communications Manager System Guide*, Understanding Route Plans.
Malicious caller identification (MCID)	Allows users to notify the system administrator about suspicious calls that are received.	For more information refer to: • *Cisco Unified Communications Manager System Guide*, Cisco Unified IP Phone" • *Cisco Unified Communications Manager Features and Services Guide*, Malicious Call Identification.
Meet-Me conference	Allows a user to host a Meet-Me conference in which other participants call a predetermined number at a scheduled time.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, Meet-Me Number/Pattern Configuration.
Message Waiting	Defines directory numbers for message-waiting on and message-waiting off indicator. A directly connected voice-messaging system uses the specified directory number to set or to clear a message-waiting indication for a particular Cisco Unified IP Phone.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide*, Message Waiting Configuration. • *Cisco Unified Communications Manager System Guide*, Voice Mail Connectivity to Cisco Unified Communications Manager.
Message waiting Indicator	A light on the handset that indicates that a user has one or more new voice messages.	For more information refer to: • *Cisco Unified Communications Manager Administration Guide*, Message Waiting Configuration. • *Cisco Unified Communications Manager System Guide*, Voice Mail Connectivity to Cisco Unified Communications Manager.
Mobile Connect	Enables users to manage business calls using a single phone number and pick up in-progress calls on the desk phone and a remote device such as a mobile phone. Users can restrict the group of callers according to phone number and time of day.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Cisco Unified Mobility.
Mobile Voice Access	Extends Mobile Connect capabilities by allowing users to access an interactive voice response (IVR) system to originate a call from a remote device such as a cellular phone.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Cisco Unified Mobility.
Music on hold	Plays music while callers are on hold.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Music On Hold.
Mute	Mutes the microphone from the handset or headset.	Requires no configuration.

Table 5-1   Telephony Features for the Cisco Unified IP Phone (continued)

Feature	Description	Configuration Reference
Onhook Dialing	Allows a user to dial a number without going off hook. The user can then either pick up the handset or press the Dial softkey.	For more information, refer to the *Cisco Unified IP Phone 6921, 6941, and 6961 User Guide*, "Basic Call Handling."
Other group pickup	Allows a user to answer a call ringing on a phone in another group that is associated with the user's group.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Call Pickup.
Privacy	Prevents users who share a line from adding themselves to a call and from viewing information on their phone display about the call of the other user.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Configuration. • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone. • *Cisco Unified Communications Manager Features and Services Guide* Barge and Privacy.
Private Line Automated Ringdown (PLAR)	The Cisco Unified Communications Manager administrator can configure a phone number that the Cisco Unified IP Phone dials as soon as the handset goes off hook. This can be useful for phones that are designated for calling emergency or "hotline" numbers.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, Directory Number Configuration.
Programmable Feature Buttons	The administrator can assign features, such as New Call, Call Back, and Forward All, etc. to line buttons.	For more information, refer to: • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone. • *Cisco Unified Communications Manager Administration Guide*, Phone Button Template Configuration.
Quality Reporting Tool (QRT)	Allows users to submit information about problem phone calls by pressing a button. QRT can be configured for either of two user modes, depending upon the amount of user interaction desired with QRT.	For more information refer to: • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone. • *Cisco Unified Communications Manager Features and Services Guide,* Quality Report Tool.
Redial	Allows users to call the most recently dialed phone number by pressing a button or the **Redial** softkey.	Requires no configuration.
Reroute Direct Calls to Remote Destination to Enterprise Number	Reroutes a direct call to users' mobile phone to the enterprise number (desk phone). For an incoming call to remote destination (mobile phone), only remote destination rings; desk phone does not ring. When the call is answered on their mobile phone, the desk phone displays a Remote In Use message. During these calls, users can make use of various features of their mobile phone.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Cisco Unified Mobility.

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Table 5-1   Telephony Features for the Cisco Unified IP Phone (continued)

Feature	Description	Configuration Reference
Ring Tone Setting	Identifies ring type used for a line when a phone has another active call.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide,* Directory Number Configuration. • "Creating Custom Phone Rings" section on page 6-2.
Secure Conference	• Allows secure phones to place conference calls using a secured conference bridge. • As new participants are added by using Confrn, Join, cBarge, Barge softkeys or MeetMe conferencing, the secure call icon displays as long as all participants use secure phones. • The Conference List displays the security level of each conference participant. Initiators can remove non-secure participants from the Conference List. (Non-initiators can add or remove conference participants if the Advanced Adhoc Conference Enabled parameter is set.)	For more information about security, see the "Overview of Supported Security Features" section on page 1-15. For additional information, see the following: • *Cisco Unified Communications Manager System Guide,* "Conference Bridges." • *Cisco Unified Communications Manager Administration Guide,* "Conference Bridge Configuration." • *Cisco Unified Communications Manager Security Guide.*
Services URL button	Allows users to access services from a programmable button rather than by using the Services menu on a phone.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Configuration. • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone Services.
Services	Allows you to use the Cisco Unified IP Phone Services Configuration menu in Cisco Unified Communications Manager Administration to define and maintain the list of phone services to which users can subscribe.	For more information refer to: • *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Configuration. • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone Services.
Shared line	Allows a user to have multiple phones that share the same phone number or allows a user to share a phone number with a coworker.	For more information, see the *Cisco Unified Communications Manager System Guide*, Understanding Directory Numbers.

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Table 5-1   *Telephony Features for the Cisco Unified IP Phone (continued)*

Feature	Description	Configuration Reference
Silent Monitoring	Allows a supervisor to silently monitor an active call. The supervisor cannot be heard by either party on the call. The user might hear a monitoring audible alert tone during a call when it is being monitored. When a call is secured, the security status of the call is displayed as a lock icon on Cisco Unified IP Phones. The connected parties might also hear an audible alert tone that indicates the call is secured and is being monitored. **Note** When an active call is being monitored or recorded, you can receive or place intercom calls; however, if you place an intercom call, the active call will be put on hold, which causes the recording session to terminate and the monitoring session to suspend. To resume the monitoring session, the party whose call is being monitored must resume the call.	For more information, see the *Cisco Unified Communications Manager Features and Services Guide*, Monitoring and Recording.
Speed-dialing	Dials a specified number that has been previously stored.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Configuration. • *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone.
Time-of-Day Routing	Restricts access to specified telephony features by time period.	For more information refer to: • *Cisco Unified Communications Manager Administration Guide,* Time Period Configuration. • *Cisco Unified Communications Manager System Guide,* Time-of-Day Routing.
Time Zone Update	Updates the Cisco Unified IP Phone with time zone changes.	For more information, see the *Cisco Unified Communications Manager Administration Guide*, Date/Time Group Configuration.
Transfer	Allows users to redirect connected calls from their phones to another number.	Some JTAPI/TAPI applications are not compatible with the Join and Direct Transfer feature implementation on the Cisco Unified IP Phone 6921, 6941, and 6961 and you may need to configure the Join and Direct Transfer Policy to disable join and direct transfer on the same line or possibly across lines. For more information, see the "Join and Direct Transfer Policy" section on page 5-14.

Table 5-1   Telephony Features for the Cisco Unified IP Phone (continued)

Feature	Description	Configuration Reference
Transfer - Direct Transfer	Transfer—The first invocation of Transfer will always initiate a new call by using the same directory number, after putting the active call on hold. Direct Transfer—This transfer joins two established calls (call is in hold or in connected state) into one call and drops the feature initiator from the call. Direct Transfer does not initiate a consultation call and does not put the active call on hold.	Some JTAPI/TAPI applications are not compatible with the Join and Direct Transfer feature implementation on the Cisco Unified IP Phone 6921, 6941, and 6961 and you may need to configure the Join and Direct Transfer Policy to disable join and direct transfer on the same line or possibly across lines. For more information, see the "Join and Direct Transfer Policy" section on page 5-14. For more information, see the *Cisco Unified Communications Manager System Guide*, Understanding Directory Numbers.
Voice messaging system	Enables callers to leave messages if calls are unanswered.	For more information, see the following: • *Cisco Unified Communications Manager Administration Guide,* Cisco Voice-Mail Port Configuration. • *Cisco Unified Communications Manager System Guide,* Voice Mail Connectivity to Cisco Unified Communications Manager.

Join and Direct Transfer Policy

Some JTAPI/TAPI applications are not compatible with the Join and Direct Transfer feature implementation on the Cisco Unified IP Phone 6921, 6941, and 6961. In order for these applications to control and monitor these phones, you must configure the Join and Direct Transfer Policy to disable join and direct transfer on the same line or possibly across lines. You can configure the Join and Direct Transfer Policy for the following:

- To configure the policy for all phones on the system, choose **System > Enterprise Phone Configurations** from Cisco Unified Communications Manager Administration.
- To configure the policy to a group of phones, choose **Device > Device Settings > Common Phone Profile** from Cisco Unified Communications Manager Administration.
- To configure the policy on an individual phone, configure the Join and Direct Transfer Policy in the Phone Configuration for the specific phone.

Because this parameter can be configured in three different windows, the setting that takes precedence is determined in the following order:

1. Device Configuration window settings
2. Common Phone Profile window settings
3. Enterprise Phone Configuration window settings.

When you change the setting of the Join and Direct Transfer Policy Parameter, you must check the "Override Common Settings" box for the setting to take effect. The default policy is to have Same line, across line enabled for join and direct transfer.

To determine the proper setting for this parameter, refer to the documentation of the JTAPI/TAPI application.

Configuring Corporate and Personal Directories

The Contact button on the Cisco Unified IP Phone 6921, 6941, and 6961 gives users access to several directories. These directories can include:

- Corporate Directory—Allows a user to look up phone numbers for co-workers.

  To support this feature, you must configure corporate directories. See the "Configuring Corporate Directories" section on page 5-15 for more information.

- Personal Directory—Allows a user to store a set of personal numbers.

  To support this feature, you must provide the user with software to configure the personal directory. See the "Configuring Personal Directory" section on page 5-15 for more information.

Configuring Corporate Directories

Cisco Unified Communications Manager uses a Lightweight Directory Access Protocol (LDAP) directory to store authentication and authorization information about users of Cisco Unified Communications Manager applications that interface with Cisco Unified Communications Manager. Authentication establishes the users' rights to access the system. Authorization identifies the telephony resources that a user is permitted to use, such as a specific phone extension.

For more information, go to Understanding Directory Numbers" in the *Cisco Unified Communications Manager System Guide*.

After completing the LDAP directory configuration, users can use the Corporate Directory service on their Cisco Unified IP Phone 6921, 6941, and 6961 to look up users in the corporate directory.

Configuring Personal Directory

Personal Directory consists of the following features:

- Personal Address Book (PAB)
- Speed Dials
- Address Book Synchronization Tool (TABSynch)

Users can access Personal Directory features by these methods:

- From a web browser—Users can access the PAB and Speed Dials features from the Cisco Unified Communications Manager User Options web pages
- From the Cisco Unified IP Phone—Choose **Contacts** to search the corporate directory or the user's personal directory.
- From a Microsoft Windows application—Users can use the TABSynch tool to synchronize their PABs with Microsoft Windows Address Book (WAB). Customers who want to use the Microsoft Outlook Address Book (OAB) should begin by importing the data from the OAB into the Windows Address Book (WAB). TabSync can then be used to synchronize the WAB with Personal Directory.

To ensure that Cisco IP Phone Address Book Synchronizer users have access only to end-user data that pertains to them, activate the Cisco UXL Web Service in Cisco Unified Serviceability.

To configure Personal Directory from a web browsers, users must access their User Options web pages. You must provide users with a URL and login information.

To synchronize with Microsoft Outlook, users must install the TABSynch utility, provided by you. To obtain the TABSynch software to distribute to users, choose **Application > Plugins** from Cisco Unified Communications Manager Administration, then locate and click **Cisco IP Phone Address Book Synchronizer**.

Modifying Phone Button Templates

Phone button templates let you assign speed dials and call-handling features to programmable line buttons. Call-handling features that can be assigned to buttons include call forward, hold, and conference.

Ideally, you modify templates before registering phones on the network. In this way, you can access customized phone button template options from Cisco Unified Communications Manager during registration.

To modify a phone button template, choose **Device > Device Settings > Phone Button Template** in Cisco Unified Communications Manager Administration. To assign a phone button template to a phone, use the Phone Button Template field in the Cisco Unified Communications Manager Administration Phone Configuration page. Refer to *Cisco Unified Communications Manager Administration Guide* and *Cisco Unified Communications Manager System Guide* for more information.

- The default Cisco Unified IP Phone 6921 template that ships with the phone uses buttons 1 and 2 for lines.
- The default Cisco Unified IP Phone 6941 template that ships with the phone uses buttons 1 through 4 for lines.
- The default Cisco Unified IP Phone 6961 template that ships with the phone uses buttons 1 through 12 for lines.

To avoid confusion for users, do not assign a feature to a button and a softkey at the same time.

For more information about softkey templates, see Configuring Softkey Templates, page 5-18.

Modifying a Phone Button Template for Personal Address Book or Speed Dials

You can modify a phone button template to associate a service URL with a line button. Doing so enables users to have single-button access to the PAB and Speed Dials. Before you modify the phone button template, you must configure PAB or Speed Dials as an IP phone service.

To configure PAB or Speed Dial as an IP phone service (if it is not already a service), follow these steps:

Procedure

Step 1   From Cisco Unified Communications Manager Administration, choose **Device >Device Settings > Phone Services**.

The Find and List IP Phone Services window displays.

Step 2   Click **Add New**.

The IP Phone Services Configuration window displays.

Step 3   Enter the following settings:

- Service Name and ASCII Service Name—Enter **Personal Address Book**.
- Service Description—Enter an optional description of the service.

- Service URL

    For PAB, enter the following URL:

    http://<*Unified CM-server-name*>**:8080/ccmpd/login.do?name=#DEVICENAME#&service=pab**

    For Fast Dial, enter the following URL:

    http://<*Unified-CM-server-name*>**:8080/ccmpd/login.do?name=#DEVICENAME#&service=fd**

- Service Category—Select **XML Service**.
- Service Type—Select **Directories**.
- Enable—Select the check box.

Step 4 Click **Save**.

You can add, update, or delete service parameters as needed as described in the *Cisco Unified Communications Manager Administration Guide*, Cisco Unified IP Phone Services Configuration.

> ✎
> **Note**   If you change the service URL, remove an IP phone service parameter, or change the name of a phone service parameter for a phone service to which users are subscribed, you must click **Update Subscriptions** to update all currently subscribed users with the changes, or users must resubscribe to the service to rebuild the correct URL.

To modify a phone button template for PAB or Fast Dial, follow these steps:

Procedure

Step 1 From Cisco Unified Communications Manager Administration, choose **Device > Device Settings > Phone Button Template**.

Step 2 Click **Find**.

Step 3 Select the phone model.

Step 4 Click **Copy**, enter a name for the new template, and then click **Save**.

The Phone Button Template Configuration window opens.

Step 5 Identify the button you would like to assign, and select **Service URL** from the Features drop-down list box associated with the line.

Step 6 Click **Save** to create a new phone button template using the service URL.

Step 7 Choose **Device > Phone** and open the Phone Configuration window for the phone.

Step 8 Select the new phone button template from the Phone Button Template drop-down list box.

Step 9 Click **Save** to store the change and then click **Reset** to implement the change.

The phone user can now access the User Options pages and associate the service with a button on the phone.

For additional information on IP phone services, see the *Cisco Unified Communications Manager Administration Guide*, Cisco Unified IP Phone Services Configuration. For additional information on configuring line buttons, go to the chapter in the *Cisco Unified Communications Manager Administration Guide*, Cisco Unified IP Phone Configuration.

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Configuring Softkey Templates

Using Cisco Unified CM Administration, you can associate up to 18 softkeys with applications that are supported by the Cisco Unified IP Phone 6921, 6941, and 6961. Cisco Unified CM support the Standard User and Standard Feature softkey template.

An application that supports softkeys can have one or more standard softkey templates associated with it. You can modify a standard softkey template by making a copy of it, giving it a new name, and making updates to that copied softkey template. You can also modify a nonstandard softkey template.

To configure softkey templates, select **Device > Device Settings > Softkey Template** from Cisco Unified CM Administration. To assign a softkey template to a phone, use the Softkey Template field in the Cisco Unified CM Administration Phone Configuration page. Refer to the in the *Cisco Unified Communications Manager Administration Guide,* Softkey Template Configuration and the *Cisco Unified Communications Manager System Guide*, Softkey Template.

The Cisco Unified IP Phones 6921, 6941, and 6961 do not support all the softkeys that are configurable in Softkey Template Configuration on Cisco Unified CM Administration. Table 5-2 lists the features, softkeys that can be configured on a softkey template, and note whether it is supported on the Cisco Unified IP Phones 6921, 6941, and 6961.

> **Note** Cisco Unified Communications Manager allows you to configure any softkey in a softkey template, but unsupported softkeys do not display on the phone.

Table 5-2   Configurable Softkeys

Feature	Configurable Softkeys in the Softkey Template Configuration	Supported as a softkey on Cisco Unified IP Phone 6921, 6941, and 6961	Notes
Answer	Answer (Answer)	Yes	—
Barge	Barge (Barge)	No	—
Call Back	Call Back (CallBack)	Yes	—
Call Forward All	Forward All (cfwdAll)	Yes	Phone displays **Fwd ALL** or **Fwd Off**.
Call Park	Call Park (Park)	Yes	—
Call Pickup	Pick Up (Pickup)	Yes	—
Conference	Conference (Confrn)	No	Conference is a dedicated button.
Conference List	Conference List (ConfList)	No	Phone displays **Detail.**
Divert	Immediate Divert (iDivert)	Yes	Phone displays **Divert**.
Do Not Disturb	Toggle Do Not Disturb (DND)	No	Configure Do Not Disturb as a programmable line button.
End Call	End Call (EndCall)	Yes	Phone displays **Cancel** if the call is not answered.
Group Pickup	Group Pick UP (GPickUp)	Yes	—
Hold	Hold (Hold)	No	Hold is a dedicated button.
Hunt Group	HLog (HLog)	No	Configure Hunt Group as a programmable feature button.

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Table 5-2   Configurable Softkeys (continued)

Feature	Configurable Softkeys in the Softkey Template Configuration	Supported as a softkey on Cisco Unified IP Phone 6921, 6941, and 6961	Notes
Join	Join (Join)	No	—
Malicious Call Identification	Toggle Malicious Call Identification (MCID)	No	Configure Malicious Call Identification as a programmable feature button.
Meet Me	Meet Me (MeetMe)	Yes	—
Mobile Connect	Mobility (Mobility)	No	Configure Mobile Connect as a programmable feature button.
New Call	New Call (NewCall)	Yes	Phone displays **New Call.**
Other Pickup	Other Pickup (oPickup)	Yes	—
Quality Reporting Tool	Quality Reporting Tool (QRT)	No	Configure Quality Reporting Tool as a programmable feature button.
Redial	Redial (Redial)	Yes	—
Remove Last Conference Participant	Remove Last Conference Participant (Remove)	Yes	Phone displays **Remove** when a participant is selected.
Resume	Resume (Resume)	Yes	—
Select	Select (Select)	Yes	—
Speed Dial	Abbreviated Dial (AbbrDial)	Yes	Phone displays **SpeedDial**.
Transfer	Direct Transfer (DirTrfr)	No	Transfer is a dedicated button. Configure transfer (Direct Transfer policy) in the Product Specific Configuration Layout section in Phone Configuration.
Video Mode Command	Video Mode Command (VidMode)	No	—

Setting Up Services

You can give users access to Cisco Unified IP Phone Services on the Cisco Unified IP Phone 6921, 6941, and 6961. You can also assign a button or a softkey to different phone services. These services comprise XML applications that enable the display of interactive content with text and graphics on the phone. Examples of services include local movie times, stock quotes, and weather reports.

Before a user can access any service,

- You must use Cisco Unified Communications Manager Administration to configure available services.

- The user must subscribe to services using the Cisco Unified CM User Options application. This web-based application provides a graphical user interface (GUI) for limited, end-user configuration of IP Phone applications.

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Before you set up services, gather the URLs for the sites you want to set up and verify that users can access those sites from your corporate IP telephony network.

To set up these services, choose **Device > Device Settings > Phone Services** from Cisco Unified Communications Manager Administration. For more information, see the *Cisco Unified Communications Manager Administration Guide,* Cisco Unified IP Phone Services Configuration, and the *Cisco Unified Communications Manager System Guide,* Cisco Unified IP Phone Services.

After you configure these services, verify that your users have access to the Cisco Unified Communications Manager User Options web-based application, from which they can select and subscribe to configured services. See the "How Users Subscribe to Services and Configure Phone Features" section on page A-2 for a summary of the information that you must provide to end users.

> **Note** To configure Cisco Extension Mobility services for users, go to the Cisco Unified Mobility"chapter in the *Cisco Unified Communications Manager Features and Services Guide*.

Adding Users to Cisco Unified Communications Manager

Adding users to Cisco Unified Communications Manager allows you to display and maintain information about users and allows each user to perform these tasks:

- Access the corporate directory and other customized directories from a Cisco Unified IP Phone.
- Create a personal directory.
- Set up speed dial and call forwarding numbers.
- Subscribe to services that are accessible from a Cisco Unified IP Phone.

You can add users to Cisco Unified Communications Manager using one of these following methods:

- To add users individually, choose **User Management > End User** from Cisco Unified Communications Manager Administration.

  For more information, see the *Cisco Unified Communications Manager Administration Guide*, End User Configuration.

- To add users in batches, use the Bulk Administration Tool. This method also enables you to set an identical default password for all users.

  For more information, see the *Cisco Unified Communications Manager Administration Guide,* Bulk Administration.

- To add users from your corporate LDAP directory, choose **System > LDAP > LDAP System** from Cisco Unified Communications Manager Administration.

  > **Note** Once the Enable Synchronization from the LDAP Server is enabled, you will not be able to add additional users from Cisco Unified Communications Manager Administration

  For more information on LDAP, see the *Cisco Unified Communications Manager System Guide,* Understanding the Directory.

- To add a user and phone at the same time choose **User Management > User/Phone Add** from Cisco Unified Communications Manager.

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Managing the User Options Web Pages

From the User Options web page, users can customize and control several phone features and settings. For detailed information about the User Options web pages, refer to *Cisco Unified IP Phone 6921, 6941, and 6961 Phone Guide*.

Giving Users Access to the User Options Web Pages

Before a user can access the User Options web pages, you must add the user to the standard Cisco Unified Communications Manager end user group and associate the appropriate phone with the user.

To add the user to the standard Cisco Unified Communications Manager end user group, you must follow these steps:

Procedure

Step 1   From Cisco Unified Communications Manager Administration, choose **User Management > User Groups**.

The Find and List Users window displays.

Step 2   Enter the appropriate search criteria and click **Find**.

Step 3   Click the **Standard CCM End Users** link. The User Group Configuration page for the Standard CCM End Users displays.

Step 4   Click **Add End Users to Group**. The Find and List Users window displays.

Step 5   Use the Find User drop-down list boxes to find the end users that you want to add and click **Find**.

Step 6   A list of end users that matches your search criteria displays.

Step 7   In the list of records that display, click the check box next to the users that you want to add to this user group. If the list comprises multiple pages, use the links at the bottom to see more results.

Note   The list of search results does not display end users that already belong to the user group.

Step 8   Click **Add Selected**.

To associate phones with the user, you must follow these steps:

Procedure

Step 1   From Cisco Unified Communications Manager Administration, choose **User Management > End User**.

The Find and List Users window displays.

Step 2   Enter the appropriate search criteria and click **Find**.

Step 3   In the list of records that display, click the link for the user.

Step 4   Click **Device Association.**

The User Device Association window displays.

Enter the appropriate search criteria and click Find.

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Step 5   Choose the device that you want to associate with the end user by checking the box to the left of the device.

Step 6   Click **Save Selected/Changes** to associate the device with the end user.

Step 7   From Related Links drop-down list box in the upper, right corner of the window, select **Back to User**, and click **Go**.

The End User Configuration window displays and the associated devices that you chose display in the Controlled Devices pane.

Step 8   Click **Save Selected/Changes.**

Make sure to provide end users with the following information about the User Options web pages:

The URL required to access the application. This URL is:

http://<*server_name:portnumber*>**/ccmuser/**, where *server_name* is the host name of the Cisco Unified Communications Manager.

- A user ID and default password are needed to access the application.

    These settings correspond to the values you entered when you added the user to Cisco Unified Communications Manager (see the "Adding Users to Cisco Unified Communications Manager" section on page 5-20).

For additional information, see the following:

- *Cisco Unified Communications Manager Administration Guide*, User Group Configuration.
- *Cisco Unified Communications Manager Administration Guide*, End User Configuration.

Specifying Options that Appear on the User Options Web Pages

Most options that are on the User Options web pages appear by default. However, the following options must be set by the system administrator by using Enterprise Parameters Configuration settings in Cisco Unified Communications Manager Administration:

- Show Ring Settings
- Show Line Text Label Settings
- Show Call Forwarding

Note   The settings apply to all User Options web pages at your site.

To specify the options that appear on the User Options web pages, follow these steps:

Procedure

Step 1   From Cisco Unified Communications Manager Administration, choose **System > Enterprise Parameters**.

The Enterprise Parameters Configuration window appears.

Step 2   In the CCMUser Parameters area, specify whether a parameter appears on the User Options web pages by choosing one of these values from the Parameter Value drop-down list box for the parameter:

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- **True**—Option displays on the User Options web pages (default except for Show Ring Settings, Show Line Text Label, and Show Call Forwarding).

- **False**—Option does not display on the User Options web pages.

- **Show All Settings**—All call forward settings display on the User Options web pages (default).

- **Hide All Settings**—No call forward settings display on the User Options web pages.

- **Show Only Call Forward All**—Only call forward all calls displays on the User Options web pages.

Configuring the Phone to Support Call Waiting

The Cisco Unified IP phones 6921, 6941, and 6961 support one call per line. Cisco Unified CM sets the Maximum Number of Calls (MNC) per line, and Busy Trigger (BT) per line attributes to 2 and 1 respectively and these fields can not be changed, As a result, the line appears to be busy to a second incoming call when there is an active call present on the line. Cisco Unified Communications Manager forwards the second incoming call based on the Call Forward Busy settings for the line. The user, who is on a call will not be notified of an incoming call. Without further configurations, the phone does not support call waiting. However, you can configure the phone to support call waiting and receive the call by configuring an additional line on an unassigned programmable button. When the user receives an incoming call while connected on a call, the phone plays the call waiting tone (single beep), displays a caller ID notification and rolls the incoming call over to the other line.

To configure call waiting on the Cisco Unified IP Phone 6921, 6941, and 6961:

1. On an unassigned programmable button on the phone, configure an additional line by either assigning the same directory number on a different partition or by assigned a different directory number.

   a. When you configure the second line by assigning the same directory number on more than one line, the DN on the second line must be on a different partition. Each time that you assign the same DN to another line, you must create a unique partition and assign the directory to that partition.

   b. When you configure the second line by assigning a different directory number, you must use a previously unassigned and unlisted number.

   The second line is an intermediary between the original line (your listed directory number) and your call busy destination, such as your voice messaging system.

2. On the original line, configure the destination for the Call Forward Busy Internal and Call Forward Busy External settings to your second line and the No Answer Ring Duration to a minimum of 10 seconds.

3. On the second line, configure the standard Call Forward All settings that you would normally use for the original line and set the No Answer Ring Duration to a minimum of 10 seconds.

Note   You will need to assign a programmable button for each listed directory number.

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C H A P T E R **6**

Customizing the Cisco Unified IP Phone

This chapter explains how you customize configuration files and phone ring sounds, and how to disable the phone screen to conserve power. Ring sounds play when the phone receives a call.

This chapter includes these topics:

Customizing and Modifying Configuration Files

You can modify configuration files (for example, edit the xml files) and add customized files (for example, custom ring tones, call back tones) to the TFTP directory. You can modify files and add customized files to the TFTP directory in Cisco Unified Communications Operating System Administration, from the TFTP Server File Upload window. Refer to *Cisco Unified Communications Operating System Administration Guide* for information about how to upload files to the TFTP folder on a Cisco Unified Communications Manager server.

You can obtain a copy of the DistinctiveRinglist.xml and List.xml files from the system using the following admin command-line interface (CLI) "file" commands (for exact syntax, refer to the *Command Line Interface Reference Guide for Cisco Unified Communications Solutions*):

- admin:file
    - file list
    - file view
    - file search
    - file get
    - file dump
    - file tail
    - file delete

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6-1

Creating Custom Phone Rings

The Cisco Unified IP Phone ships with two default ring types that are implemented in hardware: Chirp1 and Chirp2. Cisco Unified Communications Manager also provides a default set of additional phone ring sounds that are implemented in software as pulse code modulation (PCM) files. The PCM files, along with an XML file (named DistinctiveRinglist.xml) that describes the ring list options that are available at your site, exist in the TFTP directory on each Cisco Unified Communications Manager server.

For more information, see the *Cisco Unified Communications Manager System Guide*, Cisco TFTP, and the *Cisco Unified Communications Operating System Administration Guide,* Software Upgrades.

The following sections describe how you can customize the phone rings that are available at your site by creating PCM files and editing the DistinctiveRinglist.xml file:

- DistinctiveRingList File Format Requirements, page 6-2
- PCM File Requirements for Custom Ring Types, page 6-3
- Configuring a Custom Phone Ring, page 6-3

DistinctiveRingList File Format Requirements

The DistinctiveRingList.xml file defines an XML object that contains a list of phone ring types. This file can include up to 50 ring types. Each ring type contains a pointer to the PCM file that is used for that ring type and the text that will appear on the Ring Type menu on a Cisco Unified IP Phone for that ring. The Cisco TFTP server for each Cisco Unified Communications Manager contains this file.

The CiscoIPPhoneRinglist XML object uses the following simple tag set to describe the information:

```
<CiscoIPPhoneRingList>
    <Ring>
        <DisplayName/>
        <FileName/>
    </Ring>
</CiscoIPPhoneRingList>
```

The following characteristics apply to the definition names. You must include the required DisplayName and FileName for each phone ring type.

- DisplayName defines the name of the custom ring for the associated PCM file that will display on the Ring Type menu of the Cisco Unified IP Phone.
- FileName specifies the name of the PCM file for the custom ring to associate with DisplayName.

Note The DisplayName and FileName fields must not exceed 25 characters.

This example shows a DistinctiveRinglist.xml file that defines two phone ring types:

```
<CiscoIPPhoneRingList>
    <Ring>
        <DisplayName>Analog Synth 1</DisplayName>
        <FileName>Analog1.raw</FileName>
    </Ring>
    <Ring>
        <DisplayName>Analog Synth 2</DisplayName>
        <FileName>Analog2.raw</FileName>
    </Ring>
</CiscoIPPhoneRingList>
```

PCM File Requirements for Custom Ring Types

The PCM files for the rings must meet the following requirements for proper playback on Cisco Unified IP Phones:

- Raw PCM (no header)
- 8000 samples per second
- 8 bits per sample
- uLaw compression
- Maximum ring size—16080 samples
- Minimum ring size—240 samples
- Number of samples in the ring is evenly divisible by 240.
- Ring starts and ends at the zero crossing.
- To create PCM files for custom phone rings, you can use any standard audio editing packages that support these file format requirements.

Configuring a Custom Phone Ring

To create custom phone rings for the Cisco Unified IP Phone, follow these steps:

Procedure

Step 1   Create a PCM file for each custom ring (one ring per file). Ensure the PCM files comply with the format guidelines that are listed in the "PCM File Requirements for Custom Ring Types" section on page 6-3.

Upload the new PCM files that you created to the Cisco TFTP server for each Cisco Unified Communications Manager in your cluster. For more information, see the *Cisco Unified Communications Operating System Administration Guide,* Software Upgrades.

Step 2   Use an text editor to edit the DistinctiveRinglist.xml file. See the "DistinctiveRingList File Format Requirements" section on page 6-2 for information about how to format this file and for a sample DistinctiveRinglist.xml file.

Step 3   Save your modifications and close the DistinctiveRinglist.xml file.

Step 4   To cache the new DistinctiveRinglist.xml file, stop and start the TFTP service by using Cisco Unified Serviceability or disable and re-enable the "Enable Caching of Constant and Bin Files at Startup" TFTP service parameter (located in the Advanced Service Parameters).

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Configuring the Idle Display

You can specify an idle display (text only; text-file size should not exceed 1M bytes) that appears on the phone LCD screen. The idle display is an XML service that the phone invokes when the phone has been idle (not in use) for a designated period and no feature menu is open.

For detailed instructions about creating and displaying the idle display, refer to *Creating Idle URL Graphics on Cisco Unified IP Phone* at this URL:

http://www.cisco.com/en/US/products/sw/voicesw/ps556/products_tech_note09186a00801c0764.shtml

In addition, you can refer to *Cisco Unified Communications Manager Administration Guide* or to *Cisco Unified Communications Manager Bulk Administration Guide* for the following information:

- Specifying the URL of the idle display XML service:
  - For a single phone—Idle field on the Cisco Unified Communications Manager Phone configuration window
  - For multiple phones simultaneously—URL Idle field on the Cisco Unified Communications Manager Enterprise Parameters configuration window, or the Idle field in the Bulk Administration Tool (BAT)
- Specifying the length of time that the phone is not used before the idle display XML service is invoked:
  - For a single phone—Idle Timer field on the Cisco Unified Communications Manager Phone configuration window
  - For multiple phones simultaneously—URL Idle Time field on the Cisco Unified Communications Manager Enterprise Parameters configuration window, or the Idle Timer field in the Bulk Administration Tool (BAT)

From a phone, you can see settings for the idle display XML service URL and the length of time that the phone is not used before this service is invoked. To see these settings, choose **Administrator Settings > Device Configuration** and scroll to the Idle URL and the Idle URL Time parameters.

Automatically Disabling the Cisco Unified IP Phone Backlight

To conserve power and ensure the longevity of the phone screen backlight, you can set the backlight to turn off when it is not needed.

You can configure settings in Cisco Unified Communications Manager Administration to turn off the backlight at a designated time on some days and all day on other days. For example, you may choose to turn off the backlight after business hours on weekdays and all day on Saturdays and Sundays.

You can take any of these actions to turn on the backlight any time it is off:

- Press any button on the phone.

  The phone takes the action designated by that button in addition to turning on the backlight.

- Lift the handset.

When you turn the backlight on, it remains on until the phone has remained idle for a designated length of time, then it turns off automatically.

Table 6-1 explains the Cisco Unified Communications Manager Administration fields that control when the backlight turns on and off. You configure these fields in Cisco Unified Communications Manager Administration in the Product Specific configuration window. (You access this window by choosing **Device > Phone** from Cisco Unified Communications Manager Administration.)

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Table 6-1   ***Backlight On and Off Configuration Fields***

Field	Description
Days Backlight Not Active	Days that the backlight does not turn on automatically at the time specified in the Backlight On Time field.
	Choose the day or days from the drop-down list. To choose more than one day, Ctrl-click each day that you want.
Backlight On Time	Time each day that the backlight turns on automatically (except on the days specified in the Days Backlight Not Active field).
	Enter the time in this field in 24 hour format, where 0:00 is midnight.
	For example, to automatically turn the backlight on at 7:00 a.m., (0700), enter **7:00**. To turn the backlight on at 2:00 p.m. (1400), enter **14:00**.
	If this field is blank, the backlight will automatically turn on at 0:00.
Backlight On Duration	Length of time that the backlight remains on after turning on at the time specified in the backlight On Time field.
	Enter the value in this field in the format *hours*:*minutes*.
	For example, to keep the backlight on for 4 hours and 30 minutes after it turns on automatically, enter **4:30**.
	If this field is blank, the phone will turn off at the end of the day (0:00).
	Note If Backlight On Time is 0:00 and the backlight on duration is blank (or 24:00), the backlight will remain on continuously.
Backlight Idle Timeout	Length of time that the phone is idle before the backlight turns off. Applies only when the backlight was off as scheduled and was turned on by an end-user (by pressing a button on the phone or lifting the handset).
	Enter the value in this field in the format *hours*:*minutes*.
	For example, to turn the backlight off when the phone is idle for 1 hour and 30 minutes after an end-user turns the backlight on, enter **1:30**.
	The default value is 0:30.

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Viewing Model Information, Status, and Statistics on the Cisco Unified IP Phone

This chapter describes how to use the following menus on the Cisco Unified IP phones 6921, 6941, and 6961 to view model information, status messages, and network statistics for the phone:

- Model Information screen—Displays hardware and software information about the phone. For more information, see the "Model Information Screen" section on page 7-1.

- Status menu—Provides access to screens that display the status messages, network statistics, and statistics for the current call. For more information, see the "Status Menu" section on page 7-2.

You can use the information on these screens to monitor the operation of a phone and to assist with troubleshooting.

You can also obtain much of this information, and obtain other related information, remotely through the phone's web page. For more information, see Chapter 8, "Monitoring the Cisco Unified IP Phone Remotely."

For more information about troubleshooting the Cisco Unified IP Phone 6921, 6941, and 6961, see Chapter 9, "Troubleshooting and Maintenance."

This chapter includes these topics:

- Model Information Screen, page 7-1

- Status Menu, page 7-2

Model Information Screen

The Model Information screen includes the options described in Table 7-1.

To display the Model Information screen, press the **Applications** button and then select **Phone Information**.

To exit the Model Information screen, press the **Exit** softkey.

Table 7-1   Model Information Settings for the Cisco Unified IP Phone 6900 Series

Option	Description	To Change
Model Number	Model number of the phone.	Display only—cannot configure.
IP Address	IP address of the phone.	Display only—cannot configure.
MAC Address	MAC address of the phone.	Display only—cannot configure.

Table 7-1   Model Information Settings for the Cisco Unified IP Phone 6900 Series (continued)

Option	Description	To Change
Active Load	Version of firmware currently installed on the phone.	Display only—cannot configure.
Inactive Load	Version of firmware installed on the phone, but not currently running. The "Inactive Load" label also displays the status of the load, such as "Upgrade in Progress" or "Upgrade Failed."	Display only—cannot configure.
Last Upgrade	Date of the most recent firmware upgrade.	Display only—cannot configure.
Active Server	IP address or name of the server to which the phone is registered.	Display only—cannot configure.
Stand-by Server	IP address or name of the standby server.	Display only—cannot configure.

Status Menu

To display the Status menu, press the **Applications** button and then select **Administrator Settings > Status**. To exit the Status menu, press the **Back** ↩ softkey.

The Status menu includes theses options, which provide information about the phone and its operation:

- Status Messages—Displays the Status Messages screen, which shows a log of important system messages. For more information, see the "Status Messages Screen" section on page 7-2.

- Network Statistics—Displays the Network Statistics screen, which shows Ethernet traffic statistics. For more information, see the "Network Statistics Screen" section on page 7-6.

- Call Statistics—Displays counters and statistics for the current call. For more information, see the "Call Statistics Screen" section on page 7-8.

- Security Mode—Displays the Security Mode screen. For more information, see the "Security Configuration" section on page 7-10.

- Backlight On Time

- Backlight On Duration

- Backlight Idle Timeout

- Days Backlight Not Active

Status Messages Screen

The Status Messages screen displays the 10 most recent status messages that the phone has generated. You can access this screen at any time, even if the phone has not finished starting up. Table 7-2 describes the status messages that might appear. This table also includes actions you can take to address errors.

To display the Status Messages screen, follow these steps:

Procedure

Step 1   Press the **Applications** button.

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Step 2   Select **Admin Settings**.

Step 3   Select **Status.**

Step 4   Select **Status Messages.**

To remove current status messages, press the **Clear** softkey.

To exit the Status Messages screen, press the **Back** ↰ softkey.

Table 7-2   Status Messages on the Cisco Unified IP Phone 6900 Series

Message	Description	Possible Explanation and Action
CFG file not found	The name-based and default configuration file was not found on the TFTP Server.	The configuration file for a phone is created when the phone is added to the Cisco Unified Communications Manager database. If the phone has not been added to the Cisco Unified Communications Manager database, the TFTP server generates a `CFG File Not Found` response. • Phone is not registered with Cisco Unified Communications Manager. You must manually add the phone to Cisco Unified Communications Manager if you are not allowing phones to auto-register. See the "Adding Phones with Cisco Unified CM Administration" section on page 2-10 for details. • If you are using DHCP, verify that the DHCP server is pointing to the correct TFTP server. • If you are using static IP addresses, check configuration of the TFTP server. See the "Network Setup Menu" section on page 4-4 for details on assigning a TFTP server.
CFG TFTP Size Error	The configuration file is too large for file system on the phone.	Power cycle the phone.
Checksum Error	Downloaded software file is corrupted.	Obtain a new copy of the phone firmware and place it in the TFTPPath directory. You should only copy files into this directory when the TFTP server software is shut down, otherwise the files may be corrupted.
DHCP timeout	DHCP server did not respond.	• Network is busy—The errors should resolve themselves when the network load reduces. • No network connectivity between the DHCP server and the phone—Verify the network connections. • DHCP server is down—Check configuration of DHCP server. • Errors persist—Consider assigning a static IP address. See the "Network Setup Menu" section on page 4-4 for details on assigning a static IP address.

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Table 7-2   Status Messages on the Cisco Unified IP Phone 6900 Series (continued)

Message	Description	Possible Explanation and Action
DNS timeout	DNS server did not respond.	• Network is busy—The errors should resolve themselves when the network load reduces. • No network connectivity between the DNS server and the phone—Verify the network connections. • DNS server is down—Check configuration of DNS server.
DNS unknown host	DNS could not resolve the name of the TFTP server or Cisco Unified Communications Manager.	• Verify that the host names of the TFTP server or Cisco Unified Communications Manager are configured properly in DNS. • Consider using IP addresses rather than host names.
Duplicate IP	Another device is using the IP address assigned to the phone.	• If the phone has a static IP address, verify that you have not assigned a duplicate IP address. See the "Network Setup Menu" section on page 4-4 section for details. • If you are using DHCP, check the DHCP server configuration.
Error update locale	One or more localization files could not be found in the TFTPPath directory or were not valid. The locale was not changed.	From Cisco Unified Operating System Administration, check that the following files are located within subdirectories in the TFTP File Management: • Located in subdirectory with same name as network locale: – tones.xml • Located in subdirectory with same name as user locale: – glyphs.xml – dictionary.xml – kate.xml
File not found	The phone cannot locate, on the TFTP server, the phone load file that is specified in the phone configuration file.	From Cisco Unified Operating System Administration, make sure that the phone load file is on the TFTP server, and that the entry in the configuration file is correct.
IP address released	The phone has been configured to release its IP address.	The phone remains idle until it is power cycled or you reset the DHCP address. See the "Network Setup Menu" section on page 4-4 for details.
Load ID incorrect	Load ID of the software file is of the wrong type.	Check the load ID assigned to the phone (from Cisco Unified Communications Manager, choose **Device > Phone**). Verify that the load ID is entered correctly.

Table 7-2   Status Messages on the Cisco Unified IP Phone 6900 Series (continued)

Message	Description	Possible Explanation and Action
Load rejected HC	The application that was downloaded is not compatible with the phone's hardware.	Occurs if you were attempting to install a version of software on this phone that did not support hardware changes on this newer phone. Check the load ID assigned to the phone (from Cisco Unified Communications Manager, choose **Device > Phone**). Re-enter the load displayed on the phone.
No default router	DHCP or static configuration did not specify a default router.	• If the phone has a static IP address, verify that the default router has been configured. See the "Network Setup Menu" section on page 4-4 section for details. • If you are using DHCP, the DHCP server has not provided a default router. Check the DHCP server configuration.
No DNS server IP	A name was specified but DHCP or static IP configuration did not specify a DNS server address.	• If the phone has a static IP address, verify that the DNS server has been configured. See the "Network Setup Menu" section on page 4-4 section for details. • If you are using DHCP, the DHCP server has not provided a DNS server. Check the DHCP server configuration.
TFTP access error	TFTP server is pointing to a directory that does not exist.	• If you are using DHCP, verify that the DHCP server is pointing to the correct TFTP server. • If you are using static IP addresses, check configuration of TFTP server. See the "Network Setup Menu" section on page 4-4 for details on assigning a TFTP server.
TFTP file not found	The requested load file (.bin) was not found in the TFTPPath directory.	Check the load ID assigned to the phone (from Cisco Unified Communications Manager, choose **Device > Phone**). Verify that the TFTPPath directory contains a .bin file with this load ID as the name.
TFTP error	The phone does not recognize an error code provided by the TFTP server.	Contact the Cisco TAC.

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Table 7-2   Status Messages on the Cisco Unified IP Phone 6900 Series (continued)

Message	Description	Possible Explanation and Action
TFTP server not authorized	The specified TFTP server could not be found in the phone's CTL.	• The DHCP server has the wrong configuration file for the TFTP server. In this case, update the TFTP server configuration to specify the correct TFTP server. The CTL file was made and then the TFTP server address changed. In this case, regenerate the CTL file. • If the phone is using a static IP address, the phone may be configured with the wrong TFTP server address. In this case, enter the correct TFTP server address in the Network Setup menu on the phone. • If the TFTP server address is correct, there may be a problem with the CTL file. In this case, run the CTL client and update the CTL file, making sure that the proper TFTP servers are included in this file.
TFTP timeout	TFTP server did not respond.	• Network is busy—The errors should resolve themselves when the network load reduces. • No network connectivity between the TFTP server and the phone—Verify the network connections. • TFTP server is down—Check configuration of TFTP server.
Timed Out	Supplicant attempted 802.1X transaction but timed out to due the absence of an authenticator.	Authentication typically times out if 802.1X is not configured on the switch.
Version error	The name of the phone load file is incorrect.	Make sure that the phone load file has the correct name.
XmlDefault.cnf.xml, or .cnf.xml corresponding to the phone device name	Name of the configuration file.	None. This is an informational message indicating the name of the configuration file for the phone.

Network Statistics Screen

The Network Statistics screen displays information about the phone and network performance. Table 7-3 describes the information that appears in this screen.

To display the Network Statistics screen, follow these steps:

Procedure

Step 1   Press the **Applications** button.

Step 2   Select **Admin Settings.**

Step 3   Select **Status.**

Step 4   Select **Status > Network Statistics.**

To reset the Rx Frames, Tx Frames, and Rx Broadcasts statistics to 0, press the **Clear** softkey.

To exit the Network Statistics screen, press the **Back** ↰ softkey.

Table 7-3   *Network Statistics Message Information for the*
                   Cisco Unified IP Phone 6900 Series

Item	Description
Tx Frames	Number of packets sent by the phone
Tx Broadcasts	Number of broadcast packets sent by the phone
Tx Unicast	Total number of unicast packets transmitted by the phone
Rx Frames	Number of packets received by the phone
Rx Broadcasts	Number of broadcast packets received by the phone
Rx Unicast	Total number of unicast packets received by the phone
Neighbor Device ID: • Neighbor IP Address • Neighbor Port	Identifier of a device connected to this port discovered by CDP protocol.
Restart Cause—One of these values: • Hardware Reset (Power-on reset) • Software Reset (memory controller also reset) • Software Reset (memory controller not reset) • Watchdog Reset • Unknown	Cause of the last reset of the phone
Port 1	Link state and connection of the PC port (for example, `Auto 100 Mb Full-Duplex` means that the PC port is in a link-up state and has auto-negotiated a full-duplex, 100-Mbps connection)

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Table 7-3 **Network Statistics Message Information for the Cisco Unified IP Phone 6900 Series (continued)**

Item	Description
Port 2	Link state and connection of the Network port
IPv4	Information on the DHCP status. This includes the following states: CDP BOUND CDP INIT DHCP BOUND DHCP DISABLED DHCP INIT DHCP INVALID DHCP REBINDING DHCP REBOOT DHCP RENEWING DHCP REQUESTING DHCP RESYNC DHCP UNRECOGNIZED DHCP WAITING COLDBOOT TIMEOUT SET DHCP COLDBOOT SET DHCP DISABLED DISABLED DUPLICATE IP SET DHCP FAST

Call Statistics Screen

You can access the Call Statistics screen on the phone to display counters, statistics, and voice-quality metrics of the most recent call.

Note You can also remotely view the call statistics information by using a web browser to access the Streaming Statistics web page. This web page contains additional RTCP statistics not available on the phone. For more information about remote monitoring, see Chapter 8, "Monitoring the Cisco Unified IP Phone Remotely."

A single call can have multiple voice streams, but data is captured for only the last voice stream. A voice stream is a packet stream between two endpoints. If one endpoint is put on hold, the voice stream stops even though the call is still connected. When the call resumes, a new voice packet stream begins, and the new call data overwrites the former call data.

To display the Call Statistics screen for information about the latest voice stream, follow these steps:

Procedure

Step 1   Press the **Applications** button.

Step 2   Select **Admin Settings**.

Step 3   Select **Status**.

Step 4   Select **Call Statistics**.

The Call Statistics screen displays these items:

Table 7-4   Call Statistics Items for the Cisco Unified Phone 6900 Series

Item	Description
Rcvr Codec	Type of voice stream received (RTP streaming audio from codec): G.729, G.711 u-law, G.711 A-law.
Sender Codec	Type of voice stream transmitted (RTP streaming audio from codec): G.729, G.711 u-law, G.711 A-law.
Rcvr Size	Size of voice packets, in milliseconds, in the receiving voice stream (RTP streaming audio).
Sender Size	Size of voice packets, in milliseconds, in the transmitting voice stream.
Rcvr Packets	Number of RTP voice packets received since voice stream was opened. **Note** This number is not necessarily identical to the number of RTP voice packets received since the call began because the call might have been placed on hold.
Sender Packets	Number of RTP voice packets transmitted since voice stream was opened. **Note** This number is not necessarily identical to the number of RTP voice packets transmitted since the call began because the call might have been placed on hold.
Avg Jitter	Estimated average RTP packet jitter (dynamic delay that a packet encounters when going through the network) observed since the receiving voice stream was opened.
Max Jitter	Maximum jitter observed since the receiving voice stream was opened.
Rcvr Discarded	Number of RTP packets in the receiving voice stream that have been discarded (bad packets, too late, and so on). **Note** The phone will discard payload type 19 comfort noise packets that are generated by Cisco Gateways, which will increment this counter.
Rcvr Lost Packets	Missing RTP packets (lost in transit).
Voice Quality Metrics	
Cumulative Conceal Ratio	Total number of concealment frames divided by total number of speech frames received from start of the voice stream.

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Table 7-4   Call Statistics Items for the Cisco Unified Phone 6900 Series (continued)

Item	Description
Interval Conceal Ratio	Ratio of concealment frames to speech frames in preceding 3-second interval of active speech. If using voice activity detection (VAD), a longer interval might be required to accumulate 3 seconds of active speech.
Max Conceal Ratio	Highest interval concealment ratio from start of the voice stream.
Conceal Secs	Number of seconds that have concealment events (lost frames) from the start of the voice stream (includes severely concealed seconds).
Severely Conceal Secs	Number of seconds that have more than 5 percent concealment events (lost frames) from the start of the voice stream.
Latency	Estimate of the network latency, expressed in milliseconds. Represents a running average of the round-trip delay, measured when RTCP receiver report blocks are received.

Security Configuration

To display the Security Configuration screen, follow these steps.

Procedure

Step 1   Press the **Applications** button.

Step 2   Select **Admin Settings**.

Step 3   Select **Security**.

For more information, refer

The Security Configuration screen displays these items.

Table 7-5   Security Configuration Items for the Cisco Unified Phone 6900 Series

Item	Description
Security Mode	Type of voice stream received (RTP streaming audio from codec): G.729, G.711 u-law, G.711 A-law.
LSC	Type of voice stream transmitted (RTP streaming audio from codec): G.729, G.711 u-law, G.711 A-law.
Trust List	Size of voice packets, in milliseconds, in the transmitting voice stream.
802.1x Authentication	Maximum jitter observed since the receiving voice stream was opened.

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Monitoring the Cisco Unified IP Phone Remotely

Each Cisco Unified IP Phone has a web page from which you can view a variety of information about the phone, including:

- Device information
- Network setup information
- Network statistics
- Device logs
- Streaming statistics

This chapter describes the information that you can obtain from the phone's web page. You can use this information to remotely monitor the operation of a phone and to assist with troubleshooting.

You can also obtain much of this information directly from a phone. For more information, see Chapter 7, "Viewing Model Information, Status, and Statistics on the Cisco Unified IP Phone."

For more information about troubleshooting the Cisco Unified IP Phone, Chapter 9, "Troubleshooting and Maintenance."

This chapter includes these topics:

Accessing the Web Page for a Phone

To access the web page for a Cisco Unified IP Phone, perform these steps.

If you cannot access the web page, it may be disabled. See the for more information.

Procedure

Step 1   Obtain the IP address of the Cisco Unified IP Phone using one of these methods:

- Search for the phone in Cisco Unified Communications Manager by choosing **Device > Phone**. Phones registered with Cisco Unified Communications Manager display the IP address on the Find and List Phones window and at the top of the Phone Configuration window.

- On the Cisco Unified IP Phone, press the **Applications** button, choose **Administrator Settings > Network Setup**, and then scroll to the IP Address option.

Step 2   Open a web browser and enter the following URL, where *IP_address* is the IP address of the Cisco Unified IP Phone:

http://*IP_address*

The web page for a Cisco Unified IP Phone includes these topics:

- **Device Information**—Displays device settings and related information for the phone. For more information, see the .

- **Network Setup**—Displays network setup information and information about other phone settings. For more information, see the .

- **Network Statistics**—Includes the following hyperlinks, which provide information about network traffic:

  - **Ethernet Information**—Displays information about Ethernet traffic. For more information, see the .

  - **Network (Port)**—Displays information about network traffic to and from the network port on the phone. For more information, see the .

- **Device Logs**—Includes the following hyperlinks, which provide information that you can use for troubleshooting:

  - **Console Logs**—Includes hyperlinks to individual log files. For more information, see the .

  - **Core Dumps**—Includes hyperlinks to individual dump files. For more information, see the .

  - **Status Messages**—Displays up to the 10 most recent status messages that the phone has generated since it was last powered up. For more information, see the .

  - **Debug Display**—Displays debug messages that might be useful to Cisco TAC if you require assistance with troubleshooting. For more information, see the .

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- **Streaming Statistics**—Includes the following hyperlink:
  - **Stream 1**—Displays a variety of streaming statistics. For more information, see the "Streaming Statistics" section on page 8-9.

Disabling and Enabling Web Page Access

For security purposes, you may choose to prevent access to the web pages for a phone. If you do so, you will prevent access to the web pages that are described in this chapter and to the Cisco Unified CM User Options web pages.

To disable access to the web pages for a phone, follow these steps from Cisco Unified Communications Manager Administration.

Procedure

Step 1   Choose **Device > Phone**.

Step 2   Specify the criteria to find the phone and click **Find**, or click **Find** to display a list of all phones.

Step 3   Click the device name to open the Phone Configuration window for the device.

Step 4   Scroll down to the Product Specific Configuration section. From the Web Access drop-down list box, choose **Disabled**.

Step 5   Click **Update**.

Some features, such as Cisco Quality Report Tool, do not function properly without access to the phone web pages. Disabling web access also affects any serviceability application that relies on web access, such as CiscoWorks.

To enable web page access when it is disabled, see the preceding steps about disabling access. Follow the same steps, but choose **Enabled** in Step 4 to enable the web page.

Device Information

The Device Information area on a phone's web page displays device settings and related information for the phone. Table 8-1 describes these items.

To display the Device Information area, access the web page for the phone as described in the "Accessing the Web Page for a Phone" section on page 8-2, and then click the **Device Information** hyperlink.

Table 8-1   Device Information Area Items

Item	Description
MAC Address	Media Access Control (MAC) address of the phone
Host Name	Unique, fixed name that is automatically assigned to the phone based on its MAC address
Phone DN	Directory number assigned to the phone
App Load ID	Identifier of the firmware running on the phone

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Table 8-1   Device Information Area Items (continued)

Item	Description
Boot Load ID	Identifier of the factory-installed load running on the phone
Hardware Revision	Revision value of the phone hardware
Serial Number	Unique serial number of the phone
Model Number	Model number of the phone
Message Waiting	Indicates if there is a voice message waiting on the primary line for this phone.
UDI	Displays the following Cisco Unique Device Identifier (UDI) information about the phone: • Device Type—Indicates hardware type. For example, phone displays for all phone models • Device Description—Displays the name of the phone associated with the indicated model type • Product Identifier—Specifies the phone model • Version Identifier—Represents the hardware version of the phone • Serial Number—Displays the unique serial number of the phone.
Time	Time obtained from the Date/Time Group in Cisco Unified Communications Manager to which the phone belongs
Time Zone	Time zone obtained from the Date/Time Group in Cisco Unified Communications Manager to which the phone belongs
Date	Date obtained from the Date/Time Group in Cisco Unified Communications Manager to which the phone belongs

Network Setup

The Network Setup on a phone's web page displays network setup information and information about other phone settings. Table 8-2 describes these items.

You can view and set many of these items from the Network Setup Menu and the Phone Information Menu on the Cisco Unified IP Phone. For more information, see Chapter 4, "Configuring Settings on the Cisco Unified IP Phone."

To display the Network Setup area, access the web page for the phone as described in the "Accessing the Web Page for a Phone" section on page 8-2, and then click the **Network Setup** hyperlink.

Table 8-2   Network Setup Area Items

Item	Description
DHCP Server	IP address of the Dynamic Host Configuration Protocol (DHCP) server from which the phone obtains its IP address.
MAC Address	Media Access Control (MAC) address of the phone.
Host Name	Host name that the DHCP server assigned to the phone.
Domain Name	Name of the Domain Name System (DNS) domain in which the phone resides.

Table 8-2   *Network Setup Area Items (continued)*

Item	Description
IP Address	Internet Protocol (IP) address of the phone.
Subnet Mask	Subnet mask used by the phone.
TFTP Server 1	Primary Trivial File Transfer Protocol (TFTP) server used by the phone.
TFTP Server 2	Backup Trivial File Transfer Protocol (TFTP) server used by the phone.
Default Router 1–5	Default router used by the phone (Default Router 1) and optional backup routers (Default Router 2–5).
DNS Server 1–5	Primary Domain Name System (DNS) server (DNS Server 1) and optional backup DNS servers (DNS Server 2–5) used by the phone.
Operational VLAN ID	Auxiliary Virtual Local Area Network (VLAN) configured on a Cisco Catalyst switch in which the phone is a member.
Admin. VLAN ID	Auxiliary VLAN in which the phone is a member.
Unified CM 1 and 2	Host names or IP addresses, in prioritized order, of the Cisco Unified Communications Manager servers with which the phone can register. An item can also show the IP address of an SRST router that is capable of providing limited Cisco Unified Communications Manager functionality, if such a router is available. For an available server, an item will show the Cisco Unified Communications Manager server IP address and one of the following states: • Active—Cisco Unified Communications Manager server from which the phone is currently receiving call-processing services. • Standby—Cisco Unified Communications Manager server to which the phone switches if the current server becomes unavailable. • Blank—No current connection to this Cisco Unified Communications Manager server. An item may also include the Survivable Remote Site Telephony (SRST) designation, which identifies an SRST router capable of providing Cisco Unified Communications Manager functionality with a limited feature set. This router assumes control of call processing if all other Cisco Unified Communications Manager servers become unreachable. The SRST Cisco Unified Communications Manager always appears last in the list of servers, even if it is active. You configure the SRST router address in the Device Pool section in Cisco Unified Communications Manager Configuration window.
Information URL	URL of the help text that appears on the phone.
Directories URL	URL of the server from which the phone obtains directory information.
Messages URL	URL of the server from which the phone obtains message services.
Services URL	URL of the server from which the phone obtains Cisco Unified IP Phone services.
DHCP Enabled	Indicates whether DHCP is being used by the phone.
DHCP Address Released	Indicates the setting of the DHCP Address Released option on the phone's Network Setup menu.
Alternate TFTP	Indicates whether the phone is using an alternative TFTP server.

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Table 8-2   Network Setup Area Items (continued)

Item	Description
Forwarding Delay	Indicates if the internal switch begins forwarding packets between the PC port and switched port on your phone when your phone becomes active. When forwarding delay is set to disabled, the internal switch begins forwarding packets immediately. When forwarding delay is set to enabled, the internal switch waits eight seconds before forwarding packets between the PC port and the SW port. You should set forwarding delay to enabled when you connect both ports to switches for redundant uplinks or when you daisy-chain phones together.
Idle URL	URL that the phone displays when the phone has not been used for the time specified by Idle URL Time, and no menu is open.
Idle URL Time	Number of seconds that the phone has not been used and no menu is open before the XML service specified by Idle URL is activated.
Proxy Server URL	URL of proxy server, which makes HTTP requests to non-local host addresses on behalf of the phone HTTP client and provides responses from the non-local host to the phone HTTP client.
Authentication URL	URL that the phone uses to validate requests made to the phone web server.
SW Port Configuration	Speed and duplex of the switch port, where: • A—Auto Negotiate • 10H—10-BaseT/half duplex • 10F—10-BaseT/full duplex • 100H—100-BaseT/half duplex • 100F—100-BaseT/full duplex • No Link—No connection to the switch port
PC Port Configuration	Speed and duplex of the switch port, where: • A—Auto Negotiate • 10H—10-BaseT/half duplex • 10F—10-BaseT/full duplex • 100H—100-BaseT/half duplex • 100F—100-BaseT/full duplex • No Link—No connection to the PC port
TFTP Server 2	Backup TFTP server that the phone uses if the primary TFTP server is unavailable.
User Locale	User locale associated with the phone user. Identifies a set of detailed information to support users, including language, font, date and time formatting, and alphanumeric keyboard text information.
Network Locale	Network locale associated with the phone user. Identifies a set of detailed information to support the phone in a specific location, including definitions of the tones and cadences used by the phone.
Headset Enabled	Indicates whether the Headset button is enabled on the phone.
User Locale Version	Version of the user locale loaded on the phone.
Network Locale Version	Version of the network locale loaded on the phone.
PC Port Disabled	Indicates whether the PC port on the phone is enabled or disabled.
Speaker Enabled	Indicates whether the speakerphone is enabled on the phone.

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Table 8-2   Network Setup Area Items (continued)

Item	Description
GARP Enabled	Indicates whether the phone learns MAC addresses from Gratuitous ARP responses.
Video Capability Enabled	Indicates whether the phone can participate in video calls when connected to an appropriately equipped PC.
Voice VLAN Enabled	Indicates whether the phone allows a device attached to the PC port to access the Voice VLAN.
Auto Line Select	Indicates whether the phone shifts the call focus to incoming calls on all lines.
DSCP for Call Control	DSCP IP classification for call control signaling.
DSCP for Configuration	DSCP IP classification for any phone configuration transfer.
DSCP for Services	DSCP IP classification for phone-based services.
Security Mode	Displays the security mode that is set for the phone.
Web Access Enabled	Indicates whether web access is enabled (Yes) or disabled (No) for the phone.
Span to PC Port	Indicates whether the phone will forward packets transmitted and received on the network port to the access port.
PC VLAN	VLAN used to identify and remove 802.1P/Q tags from packets sent to the PC.
LLDP-MED: Switch Port	Indicates whether Link Layer Discovery Protocol Media Endpoint Discovery (LLDP-MED) is enabled on the switch port.
LLDP Power Priority	Advertises the phone's power priority to the switch, enabling the switch to appropriately provide power to the phones. Settings include: • Unknown—default • Low • High • Critical
LLDP Asset ID	Identifies the asset ID assigned to the phone for inventory management.
CDP: PC Port	Indicates whether CDP is supported on the PC port (default is enabled). Enable CDP on the PC port when Cisco VT Advantage/Unified Video Advantage (CVTA) is connected to the PC port. CVTA does not work without CDP interaction with the phone. When CDP is disabled in Cisco Unified Communications Manager, a warning is displayed, indicating that disabling CDP on the PC port prevents CVTA from working. The current PC and switch port CDP values are shown on the Settings menu.
CDP: SW Port	Indicates whether CDP is supported on the switch port (default is enabled). Enable CDP on the switch port for VLAN assignment for the phone, power negotiation, QoS management, and 802.1x security. Enable CDP on the switch port when the phone is connected to a Cisco switch. When CDP is disabled in Cisco Unified Communications Manager, a warning is presented, indicating that CDP should be disabled on the switch port only if the phone is connected to a non-Cisco switch. The current PC and switch port CDP values are shown on the Settings menu.

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Network Statistics

The following network statistics hyperlinks on a phone's web page provide information about network traffic on the phone. To display a network statistics area, access the web page for the phone as described in the "Accessing the Web Page for a Phone" section on page 8-2.

- Ethernet Information—Displays information about Ethernet traffic. Table 8-3 describes the items in this area.
- Network—Displays information about network traffic to and from the network port (10/100 SW) on the phone. Table 8-4 describes the items in this area.

Table 8-3   ***Ethernet Information Items***

Item	Description
Tx Frames	Total number of packets transmitted by the phone
Tx broadcast	Total number of broadcast packets transmitted by the phone
Tx unicast	Total number of unicast packets transmitted by the phone
Rx Frames	Total number of packets received by the phone
Rx broadcast	Total number of broadcast packets received by the phone
Rx unicast	Total number of unicast packets received by the phone

Table 8-4   ***Access Area and Network Items***

Item	Description
Tx Frames	Number of packets transmitted by the phone
Tx broadcast	Number of broadcast packets transmitted by the phone
Tx Unicast	Number of unicast packets transmitted by the phone
Rx Frames	Number of packets received by the phone
Rx broadcast	Number of broadcast packets received by the phone
Rx unicast	Number of unicast packets received by the phone
LLDP FramesOutTotal	Number of LLDP frames sent out from the phone
LLDP AgeoutsTotal	Number of LLDP frames that have been time out in cache
LLDP FramesDiscardedTotal	Number of LLDP frames that are discarded when any of the mandatory TLVs is missing or out of order or contains out of range string length.
LLDP FramesInErrorsTotal	Number of LLDP frames that received with one or more detectable errors.
LLDP FramesInTotal	Number of LLDP frames received on the phone.
LLDP TLVDiscardedTotal	Number of LLDP TLVs that are discarded.
LLDP TLVUnrecognizedTotal	Number of LLDP TLVs that are not recognized on the phone.
CDP Neighbor Device ID	Identifier of a device connected to this port discovered by CDP protocol.
CDP Neighbor IP Address	IP address of the neighbor device discovered by CDP protocol.

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Table 8-4   Access Area and Network Items (continued)

Item	Description
CDP Neighbor Port	Neighbor device port to which the phone is connected discovered by CDP protocol.
LLDP Neighbor Device ID	Identifier of a device connected to this port discovered by LLDP protocol.
LLDP Neighbor IP Address	IP address of the neighbor device discovered by LLDP protocol.
LLDP Neighbor Port	Neighbor device port to which the phone is connected discovered by LLDP protocol.
Port Information	Speed and duplex information.
IPv4	Information on the DHCP status.

Device Logs

The following device logs hyperlinks on a phone's web page provide information you can use to help monitor and troubleshoot the phone. To access a device log area, access the web page for the phone as described in the "Accessing the Web Page for a Phone" section on page 8-2.

- Console Logs—Includes hyperlinks to individual log files. The console log files include debug and error messages received on the phone.

- Core Dumps—Includes hyperlinks to individual dump files. The core dump files include data from a phone crash.

- Status Messages—Displays up to the 10 most recent status messages that the phone has generated since it was last powered up. You can also see this information from the Status Messages screen on the phone. Table 7-2 describes the status messages that can appear.

- Debug Display—Displays debug messages that might be useful to Cisco TAC if you require assistance with troubleshooting.

- Restart Cause—Displays the cause for the restart.

Streaming Statistics

A Cisco Unified IP Phone can stream information to and from up to three devices simultaneously. A phone streams information when it is on a a call or running a service that sends or receives audio or data.

The streaming statistics areas on a phone's web page provide information about the streams. Cisco Unified IP Phones 6900 Series use only Stream 1.

To display a Streaming Statistics area, access the web page for the phone as described in the "Accessing the Web Page for a Phone" section on page 8-2, and then click the **Stream 1** hyperlink.

Table 8-5 describes the items in the Streaming Statistics areas.

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Table 8-5   ***Streaming Statistics Area Items***

Item	Description
Remote Address	IP address and UDP port of the destination of the stream.
Local Address	IP address and UPD port of the phone.
Start Time	Internal time stamp indicating when Cisco Unified Communications Manager requested that the phone start transmitting packets.
Stream Status	Indication of whether streaming is active or not.
Host Name	Unique, fixed name that is automatically assigned to the phone based on its MAC address.
Sender Packets	Total number of RTP data packets transmitted by the phone since starting this connection. The value is 0 if the connection is set to receive only mode.
Sender Octets	Total number of payload octets transmitted in RTP data packets by the phone since starting this connection. The value is 0 if the connection is set to receive only mode.
Sender Codec	Type of audio encoding used for the transmitted stream.
Sender Reports Sent[1]	Number of times the RTCP Sender Report have been sent.
Sender Report Time Sent[1]	Internal time stamp indication when the last RTCP Sender Report was sent.
Rcvr Lost Packets	Total number of RTP data packets that have been lost since starting receiving data on this connection. Defined as the number of expected packets less the number of packets actually received, where the number of received packets includes any that are late or duplicate. The value displays as 0 if the connection was set to send-only mode.
Avg Jitter	Estimate of mean deviation of the RTP data packet inter-arrival time, measured in milliseconds. The value displays as 0 if the connection was set to send-only mode.
Rcvr Codec	Type of audio encoding used for the received stream.
Rcvr Reports Sent[1]	Number of times the RTCP Receiver Reports have been sent.
Rcvr Report Time Sent[1]	Internal time stamp indication when a RTCP Receiver Report was sent.
Rcvr Packets	Total number of RTP data packets received by the phone since starting receiving data on this connection. Includes packets received from different sources if this is a multicast call. The value displays as 0 if the connection was set to send-only mode.
Rcvr Octets	Total number of payload octets received in RTP data packets by the device since starting reception on the connection. Includes packets received from different sources if this is a multicast call. The value displays as 0 if the connection was set to send-only mode.
Cumulative Conceal Ratio	Total number of concealment frames divided by total number of speech frames received from start of the voice stream.
Interval Conceal Ratio	Ratio of concealment frames to speech frames in preceding 3-second interval of active speech. If using voice activity detection (VAD), a longer interval might be required to accumulate 3 seconds of active speech.
Max Conceal Ratio	Highest interval concealment ratio from start of the voice stream.
Conceal Secs	Number of seconds that have concealment events (lost frames) from the start of the voice stream (includes severely concealed seconds).
Severely Conceal Secs	Number of seconds that have more than 5 percent concealment events (lost frames) from the start of the voice stream.
Latency[1]	Estimate of the network latency, expressed in milliseconds. Represents a running average of the round-trip delay, measured when RTCP receiver report blocks are received.

Table 8-5   Streaming Statistics Area Items (continued)

Item	Description
Max Jitter	Maximum value of instantaneous jitter, in milliseconds.
Sender Size	RTP packet size, in milliseconds, for the transmitted stream.
Sender Reports Received[1]	Number of times RTCP Sender Reports have been received.
Sender Report Time Received[1]	Last time at which an RTCP Sender Report was received.
Rcvr Size	RTP packet size, in milliseconds, for the received stream.
Rcvr Discarded	RTP packets received from network but discarded from jitter buffers.
Rcvr Reports Received[1]	Number of times RTCP Receiver Reports have been received.
Rcvr Report Time Received[1]	Last time at which an RTCP Receiver Report was received.
Voice Quality Metrics	
Cumulative Conceal Ratio	Total number of concealment frames divided by total number of speech frames received from start of the voice stream.
Interval Conceal Ratio	Ratio of concealment frames to speech frames in preceding 3-second interval of active speech. If using voice activity detection (VAD), a longer interval might be required to accumulate 3 seconds of active speech.
Max Conceal Ratio	Highest interval concealment ratio from start of the voice stream.
Conceal Secs	Number of seconds that have concealment events (lost frames) from the start of the voice stream (includes severely concealed seconds).
Severely Conceal Secs	Number of seconds that have more than 5 percent concealment events (lost frames) from the start of the voice stream.

1. When the RTP Control Protocol is disabled, no data generates for this field and thus displays as 0.

Related Topics

- "Configuring Settings on the Cisco Unified IP Phone" chapter

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Troubleshooting and Maintenance

This chapter provides information that can assist you in troubleshooting problems with your Cisco Unified IP Phone or with your IP telephony network. It also explains how to clean and maintain your phone.

If you need additional assistance to resolve an issue, see the "Obtaining Documentation, Obtaining Support, and Security Guidelines" section on page xiii.

This chapter includes these topics:

- Resolving Startup Problems, page 9-1
- Cisco Unified IP Phone Resets Unexpectedly, page 9-6
- Troubleshooting Cisco Unified IP Phone Security, page 9-8
- General Troubleshooting Tips, page 9-9
- Resetting or Restoring the Cisco Unified IP Phone, page 9-12
- Monitoring the Voice Quality of Calls, page 9-13
- Where to Go for More Troubleshooting Information, page 9-14
- Cleaning the Cisco Unified IP Phone, page 9-14

Resolving Startup Problems

After installing a Cisco Unified IP Phone into your network and adding it to Cisco Unified Communications Manager, the phone should start up as described in the "Verifying the Phone Startup Process" section on page 3-12. If the phone does not start up properly, see the following sections for troubleshooting information:

- Symptom: The Cisco Unified IP Phone Does Not Go Through its Normal Startup Process, page 9-2
- Symptom: The Cisco Unified IP Phone Does Not Register with Cisco Unified Communications Manager, page 9-2
- Symptom: Cisco Unified IP Phone Unable to Obtain IP Address, page 9-5

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Symptom: The Cisco Unified IP Phone Does Not Go Through its Normal Startup Process

When you connect a Cisco Unified IP Phone into the network port, the phone should go through its normal startup process as described in "Verifying the Phone Startup Process" section on page 3-12 and the LCD screen should display information. If the phone does not go through the startup process, the cause may be faulty cables, bad connections, network outages, lack of power, and so on. Or, the phone may not be functional.

To determine whether the phone is functional, follow these suggestions to systematically eliminate these other potential problems:

1. Verify that the network port is functional:

   – Exchange the Ethernet cables with cables that you know are functional.

   – Disconnect a functioning Cisco Unified IP Phone from another port and connect it to this network port to verify the port is active.

   – Connect the Cisco Unified IP Phone that will not start up to a different network port that is known to be good.

   – Connect the Cisco Unified IP Phone that will not start up directly to the port on the switch, eliminating the patch panel connection in the office.

2. Verify that the phone is receiving power:

   – If you are using external power, verify that the electrical outlet is functional.

   – If you are using in-line power, use the external power supply instead.

   – If you are using the external power supply, switch with a unit that you know to be functional.

3. If the phone still does not start up properly, power up the phone with the handset off-hook. When the phone is powered up in this way, it attempts to launch a backup software image.

4. If the phone still does not start up properly, perform a factory reset of the phone. For instructions, see the "Performing a Factory Reset" section on page 9-12.

If after attempting these solutions, the LCD screen on the Cisco Unified IP Phone does not display any characters after at least five minutes, contact a Cisco technical support representative for additional assistance.

Symptom: The Cisco Unified IP Phone Does Not Register with Cisco Unified Communications Manager

If the phone proceeds past the first stage of the startup process (LED buttons flashing on and off) but continues to cycle through the messages displaying on the LCD screen, the phone is not starting up properly. The phone cannot successfully start up unless it is connected to the Ethernet network and it has registered with a Cisco Unified Communications Manager server.

These sections can assist you in determining the reason the phone is unable to start up properly:

- Identifying Error Messages, page 9-3
- Checking Network Connectivity, page 9-3
- Verifying TFTP Server Settings, page 9-3
- Verifying IP Addressing and Routing, page 9-3

- Verifying DNS Settings, page 9-4
- Cisco CallManager and TFTP Services Are Not Running, page 9-4
- Creating a New Configuration File, page 9-4
- Checking Network Connectivity, page 9-3

In addition, problems with security may prevent the phone from starting up properly. See the "Troubleshooting Cisco Unified IP Phone Security" section on page 9-8 for more information.

Identifying Error Messages

As the phone cycles through the startup process, you can access status messages that might provide you with information about the cause of a problem. See the "Status Messages Screen" section on page 7-2 for instructions about accessing status messages and for a list of potential errors, their explanations, and their solutions.

Checking Network Connectivity

If the network is down between the phone and the TFTP server or Cisco Unified Communications Manager, the phone cannot start up properly. Ensure that the network is currently running.

Verifying TFTP Server Settings

You can determine the IP address of the TFTP server used by the phone by pressing the **Applications** button, then selecting **Administrator Settings > Network Setup > IPv4 > TFTP Server 1**.

If you have assigned a static IP address to the phone, you must manually enter a setting for the TFTP Server 1 option. See the "Network Setup Menu" section on page 4-4.

If you are using DHCP, the phone obtains the address for the TFTP server from the DHCP server. Check the IP address configured in Option 150.

You can also enable the phone to use an alternate TFTP server. Such a setting is particularly useful if the phone was recently moved from one location to another. See the "Network Setup Menu" section on page 4-4 for instructions.

Verifying IP Addressing and Routing

You should verify the IP addressing and routing settings on the phone. If you are using DHCP, the DHCP server should provide these values. If you have assigned a static IP address to the phone, you must enter these values manually.

On the Cisco Unified IP Phone, press the **Applications** button, then select **Administrator Settings > Network Setup > IPv4**, and look at the following options:

- Boot/DHCP Server—If you have assigned a static IP address to the phone, you do not need to enter a value for the DHCP Server option. However, if you are using a DHCP server, this option must have a value. If it does not, check your IP routing and VLAN configuration. Refer to the *Troubleshooting Switch Port and Interface Problems* document, available at this URL: http://www.cisco.com/en/US/customer/products/hw/switches/ps700/products_tech_note09186a00 8015bfd6.shtml
- IP Address, Subnet Mask, Default Router—If you have assigned a static IP address to the phone, you must manually enter settings for these options. See the "Network Setup Menu" section on page 4-4 for instructions.

If you are using DHCP, check the IP addresses distributed by your DHCP server. Refer to the *Understanding and Troubleshooting DHCP in Catalyst Switch or Enterprise Networks* document, available at this URL:
http://www.cisco.com/en/US/tech/tk648/tk361/technologies_tech_note09186a00800f0804.shtml

Verifying DNS Settings

If you are using DNS to refer to the TFTP server or to Cisco Unified Communications Manager, you must ensure that you have specified a DNS server. Verify this setting by pressing the **Applications** button, then selecting **Administrator Settings > Network Setup > IPv4 > DNS Server 1**. You should also verify that there is a CNAME entry in the DNS server for the TFTP server and for the Cisco Unified Communications Manager system.

You must also ensure that DNS is configured to do reverse look-ups.

Cisco CallManager and TFTP Services Are Not Running

If the Cisco CallManager or TFTP services are not running, phones may not be able to start up properly. However, in such a situation, it is likely that you are experiencing a system-wide failure, and other phones and devices are unable to start up properly.

If the Cisco CallManager service is not running, all devices on the network that rely on it to make phone calls will be affected. If the TFTP service is not running, many devices will not be able to start up successfully.

To start a service, follow these steps:

Procedure

Step 1   From Cisco Unified Communications Manager Administration, choose **Cisco Unified Serviceability** from the Navigation drop-down list and click **Go**.

Step 2   Choose **Tools > Control Center - Feature Services**.

Step 3   Choose the primary Cisco Unified Communications Manager server from the Server drop-down list.

The window displays the service names for the server that you chose, the status of the services, and a service control panel to start or stop a service.

Step 4   If a service has stopped, click its radio button and then click the **Start** button.

The Service Status symbol changes from a square to an arrow.

Note   A service must be activated before it can be started or stopped. To activate a service, choose **Tools > Service Activation**.

Creating a New Configuration File

If you continue to have problems with a particular phone that other suggestions in this chapter do not resolve, the configuration file may be corrupted.

To create a new configuration file, follow these steps:

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Procedure

Step 1   From Cisco Unified Communications Manager, choose **Device > Phone > Find** to locate the phone experiencing problems.

Step 2   Choose **Delete** to remove the phone from the Cisco Unified Communications Manager database.

Step 3   Add the phone back to the Cisco Unified Communications Manager database. See the "Adding Phones to the Cisco Unified CM Database" section on page 2-8 for details.

Step 4   Power cycle the phone.

> **Note**   • When you remove a phone from the Cisco Unified Communications Manager database, its configuration file is deleted from the Cisco Unified Communications Manager TFTP server. The phone's directory number or numbers remain in the Cisco Unified Communications Manager database. They are called "unassigned DNs" and can be used for other devices. If unassigned DNs are not used by other devices, delete them from the Cisco Unified Communications Manager database. You can use the Route Plan Report to view and delete unassigned reference numbers. Refer to *Cisco Unified Communications Manager Administration Guide* for more information.
>
> • Changing the buttons on a phone button template, or assigning a different phone button template to a phone, may result in directory numbers that are no longer accessible from the phone. The directory numbers are still assigned to the phone in the Cisco Unified Communications Manager database, but there is no button on the phone with which calls can be answered. These directory numbers should be removed from the phone and deleted if necessary.

Registering the Phone with Cisco Unified Communications Manager

A Cisco Unified IP Phone can register with a Cisco Unified Communications Manager server only if the phone has been added to the server or if auto-registration is enabled and if there are sufficient number of unit licenses. Review the information and procedures in the "Adding Phones to the Cisco Unified CM Database" section on page 2-8 to ensure that the phone has been added to the Cisco Unified Communications Manager database.

To verify that the phone is in the Cisco Unified Communications Manager database, choose **Device > Phone > Find** from Cisco Unified Communications Manager Administration to search for the phone based on its MAC Address. For information about determining a MAC address, see the "Determining the MAC Address for a Cisco Unified IP Phone" section on page 2-11.

If the phone is already in the Cisco Unified Communications Manager database, its configuration file may be damaged. See the "Creating a New Configuration File" section on page 9-4 for assistance.

For more information on licensing go to the Licenses for Phones section in the *Cisco Unified Communications Manager System Guide*

Symptom: Cisco Unified IP Phone Unable to Obtain IP Address

If a phone is unable to obtain an IP address when it starts up, the phone may be not be on the same network or VLAN as the DHCP server, or the switch port to which the phone is connected may be disabled. Make sure that the network or VLAN to which the phone is connected has access to the DHCP server, and make sure that the switch port is enabled.

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Cisco Unified IP Phone Resets Unexpectedly

If users report that their phones are resetting during calls or while idle on their desk, you should investigate the cause. If the network connection and Cisco Unified Communications Manager connection are stable, a Cisco Unified IP Phone should not reset on its own.

Typically, a phone resets if it has problems connecting to the Ethernet network or to Cisco Unified Communications Manager. These sections can help you identify the cause of a phone resetting in your network:

- Verifying the Physical Connection, page 9-6
- Identifying Intermittent Network Outages, page 9-6
- Verifying DHCP Settings, page 9-6
- Checking Static IP Address Settings, page 9-7
- Verifying the Voice VLAN Configuration, page 9-7
- Verifying that the Phones Have Not Been Intentionally Reset, page 9-7
- Eliminating DNS or Other Connectivity Errors, page 9-7

Verifying the Physical Connection

Verify that the Ethernet connection to which the Cisco Unified IP Phone is connected is up. For example, check whether the particular port or switch to which the phone is connected is down and that the switch is not rebooting. Also make sure that there are no cable breaks.

Identifying Intermittent Network Outages

Intermittent network outages affect data and voice traffic differently. Your network might have been experiencing intermittent outages without detection. If so, data traffic can resend lost packets and verify that packets are received and transmitted. However, voice traffic cannot recapture lost packets. Rather than retransmitting a lost network connection, the phone resets and attempts to reconnect its network connection.

If you are experiencing problems with the voice network, you should investigate whether an existing problem is simply being exposed.

Verifying DHCP Settings

The following suggestions can help you determine if the phone has been properly configured to use DHCP:

1. Verify that you have properly configured the phone to use DHCP. See the "Network Setup Menu" section on page 4-4 for more information.
2. Verify that the DHCP server has been set up properly.
3. Verify the DHCP lease duration. Cisco recommends that you set it to 8 days.

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Checking Static IP Address Settings

If the phone has been assigned a static IP address, verify that you have entered the correct settings. See the "Network Setup Menu" section on page 4-4 for more information.

Verifying the Voice VLAN Configuration

If the Cisco Unified IP Phone appears to reset during heavy network usage (for example, following extensive web surfing on a computer connected to the same switch as the phone), it is likely that you do not have a voice VLAN configured.

Isolating the phones on a separate auxiliary VLAN increases the quality of the voice traffic. See the "Understanding How the Cisco Unified IP Phone Interacts with the VLAN" section on page 2-2 for details.

Verifying that the Phones Have Not Been Intentionally Reset

If you are not the only administrator with access to Cisco Unified Communications Manager, you should verify that no one else has intentionally reset the phones.

You can check whether a Cisco Unified IP Phone received a command from Cisco Unified Communications Manager to reset by pressing the **Applications** button on the phone and choosing **Administrator Settings** > **Status > Network Statistics**. If the phone was recently reset, one of these messages appears:

- Reset-Reset—Phone closed due to receiving a Reset/Reset from Cisco Unified Communications Manager Administration.
- Reset-Restart—Phone closed due to receiving a Reset/Restart from Cisco Unified Communications Manager Administration.

Eliminating DNS or Other Connectivity Errors

If the phone continues to reset, follow these steps to eliminate DNS or other connectivity errors:

Procedure

Step 1 Use the Reset Settings menu to reset phone settings to their default values. See the "Resetting or Restoring the Cisco Unified IP Phone" section on page 9-12 for details.

Step 2 Modify DHCP and IP settings:

- **a.** Disable DHCP. See the "Network Setup Menu" section on page 4-4 for instructions.
- **b.** Assign static IP values to the phone. See the "Network Setup Menu" section on page 4-4 for instructions. Use the same default router setting used for other functioning Cisco Unified IP Phones.
- **c.** Assign a TFTP server. See the "Network Setup Menu" section on page 4-4 for instructions. Use the same TFTP server used for other functioning Cisco Unified IP Phones.

Step 3 On the Cisco Unified Communications Manager server, verify that the local host files have the correct Cisco Unified Communications Manager server name mapped to the correct IP address.

Step 4   From Cisco Unified Communications Manager, choose **System > Server** and verify that the server is referred to by its IP address and not by its DNS name.

Step 5   From Cisco Unified Communications Manager, choose **Device > Phone > Find** and verify that you have assigned the correct MAC address to this Cisco Unified IP Phone. For information about determining a MAC address, see the "Determining the MAC Address for a Cisco Unified IP Phone" section on page 2-11.

Step 6   Power cycle the phone.

Checking Power Connection

In most cases, a phone will restart if it powers up by using external power but loses that connection and switches to PoE. Similarly, a phone may restart if it powers up by using PoE and then gets connected to an external power supply.

Troubleshooting Cisco Unified IP Phone Security

Table 9-1 provides troubleshooting information for the security features on the Cisco Unified IP Phone. For information relating to the solutions for any of these issues, and for additional troubleshooting information about security and encryption, refer to *Cisco Unified Communications Manager Security Guide*.

Table 9-1   *Cisco Unified IP Phone Security Troubleshooting*

Problem	Possible Cause
Device authentication error.	CTL file does not have a Cisco Unified Communications Manager certificate or has an incorrect certificate.
Phone cannot authenticate CTL file.	The security token that signed the updated CTL file does not exist in the CTL file on the phone.
Phone cannot authenticate any of the configuration files other than the CTL file.	Bad TFTP record.
Phone does not register with Cisco Unified Communications Manager.	The CTL file does not contain the correct information for the Cisco Unified Communications Manager server.
Phone does not request signed configuration files.	The CTL file does not contain any TFTP entries with certificates.

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Table 9-1   Cisco Unified IP Phone Security Troubleshooting (continued)

Problem	Possible Cause
802.1X Enabled on Phone but Not Authenticating	
Phone cannot obtain a DHCP-assigned IP address	These errors typically indicate that 802.1X is enabled on the phone, but the phone is unable to authenticate.
Phone does not register with Cisco Unified Communications Manager	**1.** Verify that you have properly configured the required components "Supporting 802.1X Authentication on Cisco Unified IP Phones" section on page 1-20.
Phone status display as "Configuring IP" or "Registering"	**2.** Confirm that the shared secret is configured on the phone (see the "Security Configuration Menu" section on page 4-8 for more information).
802.1X Authentication Status displays as "Held" (see the "802.1X Authentication and Status" section on page 4-9).	– If the shared secret is configured, verify that you have the same shared secret entered on the authentication server.
Status menu displays 802.1x status as "Failed" (see the "Call Statistics Screen" section on page 7-8).	– If the shared secret is not configured, enter it, and ensure that it matches the one on the authentication server.
802.1X Not Enabled	
Phone cannot obtain a DHCP-assigned IP address	These errors typically indicate that 802.1X is not enabled on the phone. To enable it, see the "Security Configuration Menu" section on page 4-8 for information on enabling 802.1X on the phone.
Phone does not register with Cisco Unified Communications Manager	
Phone status display as "Configuring IP" or "Registering"	
802.1X Authentication Status displays as "Disabled" (see the "802.1X Authentication and Status" section on page 4-9).	
Status menu displays DHCP status as timing out (see the "Call Statistics Screen" section on page 7-8).	
Factory Reset Deleted 802.1X Shared Secret	
Phone cannot obtain a DHCP-assigned IP address	These errors typically indicate that the phone has completed a factory reset while 802.1X was enabled. A factory reset deletes the shared secret, which is required for 802.1X authentication and network access. To resolve this, you have two options:
Phone does not register with Cisco Unified Communications Manager	• Temporarily disable 802.1X on the switch.
Phone status display as "Configuring IP" or "Registering"	• Temporarily move the phone to a network environment that is not using 802.1X authentication.
Cannot access phone menus to verify 802.1X status	Once the phone starts up normally in one of these conditions, you can access the 802.1X configuration menus and re-enter the shared secret.

General Troubleshooting Tips

Table 9-2 provides general troubleshooting information for the Cisco Unified IP Phone.

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Table 9-2   Cisco Unified IP Phone Troubleshooting

Summary	Explanation
Connecting a Cisco Unified IP Phone to another Cisco Unified IP Phone/	Cisco does not support connecting an IP phone to another IP phone through the PC port. Each IP phone should directly connect to a switch port. If phones are connected together in a line (by using the PC port), the phones will not work.
Poor quality when calling digital cell phones using the G.729 protocol.	In Cisco Unified Communications Manager, you can configure the network to use the G.729 protocol (the default is G.711). When using G.729, calls between an IP phone and a digital cellular phone will have poor voice quality. Use G.729 only when absolutely necessary.
Prolonged broadcast storms cause IP phones to reset, or be unable to make or answer a call.	A prolonged Layer 2 broadcast storm (lasting several minutes) on the voice VLAN may cause IP phones to reset, lose an active call, or be unable to initiate or answer a call. Phones may not come up until a broadcast storm ends.
Moving a network connection from the phone to a workstation.	If you are powering your phone through the network connection, you must be careful if you decide to unplug the phone's network connection and plug the cable into a desktop computer. ⚠ **Caution** The computer's network card cannot receive power through the network connection; if power comes through the connection, the network card can be destroyed. To protect a network card, wait 10 seconds or longer after unplugging the cable from the phone before plugging it into a computer. This delay gives the switch enough time to recognize that there is no longer a phone on the line and to stop providing power to the cable.
Changing the telephone configuration.	By default, the network setup options are locked to prevent users from making changes that could impact their network connectivity. You must unlock the network setup options before you can configure them. See the "Unlocking and Locking Options" section on page 4-3 for details.
Phone resetting.	The phone resets when it loses contact with the Cisco Unified Communications Manager software. This lost connection can be due to any network connectivity disruption, including cable breaks, switch outages, and switch reboots.
LCD display issues.	If the display appears to have rolling lines or a wavy pattern, it might be interacting with certain types of older fluorescent lights in the building. Moving the phone away from the lights, or replacing the lights, should resolve the problem.
Dual-Tone Multi-Frequency (DTMF) delay.	When you are on a call that requires keypad input, if you press the keys too quickly, some of them might not be recognized.
Codec mismatch between the phone and another device.	The RxType and the TxType statistics show the codec that is being used for a conversation between this Cisco Unified IP phone and the other device. The values of these statistics should match. If they do not, verify that the other device can handle the codec conversation, or that a transcoder is in place to handle the service. See the "Call Statistics Screen" section on page 7-8 for information about displaying these statistics.

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Table 9-2   Cisco Unified IP Phone Troubleshooting (continued)

Summary	Explanation
Sound sample mismatch between the phone and another device.	The RxSize and the TxSize statistics show the size of the voice packets that are being used in a conversation between this Cisco Unified IP phone and the other device. The values of these statistics should match. See the "Call Statistics Screen" section on page 7-8 for information about displaying these statistics.
Gaps in voice calls.	Check the AvgJtr and the MaxJtr statistics. A large variance between these statistics might indicate a problem with jitter on the network or periodic high rates of network activity. See the "Call Statistics Screen" section on page 7-8 for information about displaying these statistics.
Loopback condition.	A loopback condition can occur when the following conditions are met: • The SW Port Configuration option in the Network Setup menu on the phone is set to **10 Half** (10-BaseT / half duplex) • The phone receives power from an external power supply • The phone is powered down (the power supply is disconnected) In this case, the switch port on the phone can become disabled and the following message will appear in the switch console log: HALF_DUX_COLLISION_EXCEED_THRESHOLD To resolve this problem, re-enable the port from the switch.
One-way audio.	When at least one person in a call does not receive audio, IP connectivity between phones is not established. Check the configurations in routers and switches to ensure that IP connectivity is properly configured.
Phone call cannot be established	The phone does not have a DHCP IP address, is unable to register to Cisco Unified Communications Manager, and shows a Configuring IP or Registering message. Verify the following: 1. The Ethernet cable is attached. 2. The Cisco CallManager service is running on the Cisco Unified Communications Manager server. 3. Both phones are registered to the same Cisco Unified Communications Manager. 4. Audio server debug and capture logs are enabled for both phones. If needed, enable Java debug.

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Resetting or Restoring the Cisco Unified IP Phone

There are two general methods for resetting or restoring the Cisco Unified IP Phone:

Performing a Basic Reset

Performing a basic reset of a Cisco Unified IP Phone provides a way to recover if the phone experiences an error and provides a way to reset or restore various configuration and security settings.

Table 9-3 describes the ways to perform a basic reset. You can reset a phone with any of these operations after the phone has started up. Choose the operation that is appropriate for your situation.

Table 9-3   Basic Reset Methods

Operation	Performing	Explanation
Restart phone	Press the **Services**, **Applications, or Directories** button and then press ****#****.	Resets any user and network setup changes that you have made, but that the phone has not written to its Flash memory, to previously saved settings, then restarts the phone.
Reset Settings	To reset settings, press the **Applications** button and choose **Admin Settings > Reset Settings > Network**.	Resets user and network setup settings to their default values, and restarts the phone.
	To reset the CTL file, press the **Applications** button and choose **Admin Settings > Reset Settings > Security**.	Resets the CTL file.

Performing a Factory Reset

When you perform a factory reset of the Cisco Unified IP Phone, the following information is erased or reset to its default value:

- User configuration settings—Reset to default values
- Network setup settings—Reset to default values
- Call histories—Erased
- Locale information—Reset to default values

Before you perform a factory reset, ensure that the following conditions are met:

- The phone must be on a DHCP-enabled network.
- A valid TFTP server must be set in DHCP option 150 or option 66 on the DHCP server.

To perform a factory reset of a phone, you can press the Applications button and choose **Admin Settings > Reset Settings > All**.

Alternatively, you can also follow these steps:

Procedure

Step 1   While powering up the phone, press and hold #.

Step 2   When the light on the mute button and handset light strip turns off and all other lights (line button, headset button, speakerphone button and select button) stay green, press **123456789*0#** in sequence.

When you press 1, the lights on the line buttons turn red. The light on the select button flash when a button is pressed.

If you press the buttons out of sequence, the lights on the line button, headset button, speakerphone button, and select button turn green. You will need to start over and press **123456789*0#** in sequence again.

After you press these buttons, the phone goes through the factory reset process.

Do not power down the phone until it completes the factory reset process, and the main screen appears.

Monitoring the Voice Quality of Calls

To measure the voice quality of calls that are sent and received within the network, Cisco Unified IP Phones use these statistical metrics that are based on concealment events. The DSP plays concealment frames to mask frame loss in the voice packet stream.

- Concealment Ratio metrics—Show the ratio of concealment frames over total speech frames. An interval conceal ratio is calculated every 3 seconds.

- Concealed Second metrics—Show the number of seconds in which the DSP plays concealment frames due to lost frames. A severely "concealed second" is a second in which the DSP plays more than five percent concealment frames.

Note   Concealment ratio and concealment seconds are primary measurements based on frame loss. A Conceal Ratio of zero indicates that the IP network is delivering frames and packets on time with no loss.

You can access voice quality metrics from the Cisco Unified IP Phone by using the Call Statistics screen (see the "Call Statistics Screen" section on page 7-8) or remotely by using Streaming Statistics (see the Monitoring the Cisco Unified IP Phone Remotely chapter).

Troubleshooting Tips

When you observe significant and persistent changes to metrics, use Table 9-4 for general troubleshooting information.

Table 9-4   *Changes to Voice Quality Metrics*

Metric Change	Condition
Conceal Ratio and Conceal Seconds increase significantly	Network impairment from packet loss or high jitter.

Table 9-4   *Changes to Voice Quality Metrics*

Metric Change	Condition
Conceal Ratio is near or at zero, but the voice quality is poor.	• Noise or distortion in the audio channel such as echo or audio levels. • Tandem calls that undergo multiple encode/decode such as calls to a cellular network or calling card network. • Acoustic problems coming from a speakerphone, handsfree cellular phone or wireless headset. Check packet transmit (TxCnt) and packet receive (RxCnt) counters to verify that voice packets are flowing.

Note Voice quality metrics do not account for noise or distortion, only frame loss.

Where to Go for More Troubleshooting Information

If you have additional questions about troubleshooting the Cisco Unified IP Phones, several Cisco.com web sites can provide you with more tips. Choose from the sites available for your access level.

- Cisco Unified IP Phone Troubleshooting Resources:

  http://www.cisco.com/en/US/products/hw/phones/ps379/tsd_products_support_troubleshoot_and_alerts.html

- Cisco Products and Services (Technical Support and Documentation):

  http://www.cisco.com/en/US/products/ps10326/tsd_products_support_series_home.html

Cleaning the Cisco Unified IP Phone

To clean your Cisco Unified IP phone, use only a dry soft cloth to gently wipe the phone and the LCD screen. Do not apply liquids or powders directly on the phone. As with all non-weather-proof electronics, liquids and powders can damage the components and cause failures.

Providing Information to Users Via a Website

If you are a system administrator, you are likely the primary source of information for Cisco Unified IP Phone users in your network or company. It is important to provide current and thorough information to end users.

Cisco recommends that you create a web page on your internal support site that provides end users with important information about their Cisco Unified IP Phones.

Consider including the following types of information on this site:

- How Users Obtain Support for the Cisco Unified IP Phone, page A-1
- How Users Subscribe to Services and Configure Phone Features, page A-2
- How Users Subscribe to Services and Configure Phone Features, page A-2
- How Users Access a Voice Messaging System, page A-2
- How Users Configure Personal Directory Entries, page A-3

How Users Obtain Support for the Cisco Unified IP Phone

To successfully use some of the features on the Cisco Unified IP Phone (including speed dial, services, and voice messaging system options), users must receive information from you or from your network team or be able to contact you for assistance. Make sure to provide end users with the names of people to contact for assistance and with instructions for contacting those people.

Giving Users Access to the User Options Web Pages

Before a user can access the User Options web pages, you must use Cisco Unified Communications Manager Administration to add the user to a standard Cisco Unified Communications Manager end user group: choose **User Management > User Groups**. For additional information, refer to:

- "User Group Configuration" chapter in the *Cisco Unified Communications Manager Administration Guide*
- "Role Configuration" chapter in the *Cisco Unified Communications Manager Administration Guide*

How Users Subscribe to Services and Configure Phone Features

End users can perform a variety of activities by using the Cisco Unified Communications Manager User Options web pages. These activities include subscribing to services, setting up speed dial and call forwarding numbers, configuring ring settings, and creating a personal address book. Keep in mind that configuring settings on a phone by using a website might be new for your end users. You need to provide as much information as possible to ensure that they can successfully access and use the User Options web pages.

Make sure to provide end users with the following information about the User Options web pages:

- The URL required to access the application. This URL is:

  http://<*server_name:portnumber*>**/ccmuser/**, where *server_name* is the host on which the web server is installed.

- A user ID and default password are needed to access the application.

  These settings correspond to the values you entered when you added the user to Cisco Unified Communications Manager (see the "Adding Users to Cisco Unified Communications Manager" section on page 5-20).

- A brief description of what a web-based, graphical user interface application is, and how to access it with a web browser.

- An overview of the tasks that users can accomplish by using the web page.

For information using the User Options web pages, refer to *Cisco Unified IP Phone 6921, 6941, and 6961 User Guide for Cisco Unified Communications Manager 8.0*

How Users Access a Voice Messaging System

Cisco Unified Communications Manager lets you integrate with many different voice messaging systems, including the Cisco Unity voice messaging system. Because you can integrate with a variety of systems, you must provide users with information about how to use your specific system.

You should provide this information to each user:

- How to access the voice messaging system account.

  Make sure that you have used Cisco Unified Communications Manager to configure the **Messages** button on the Cisco Unified IP Phone.

- Initial PIN for accessing the voice messaging system.

  Make sure that you have configured a default voice messaging system PIN for all users.

- How the phone indicates that voice messages are waiting.

  Make sure that you have used Cisco Unified Communications Manager to set up a message waiting indicator (MWI) method.

For information using a voice messaging system, refer to *Cisco Unified IP Phone 6921, 6941, and 6961 User Guide for Cisco Unified Communications Manager8.0.*

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How Users Configure Personal Directory Entries

Users can configure personal directory entries on the Cisco Unified IP Phone. To configure a personal directory, users must have access to User Options web pages. Make sure that users know how to access their User Options web pages. See the "How Users Subscribe to Services and Configure Phone Features" section on page A-2 for details.

Cisco Unified IP Phone Address Book Synchronizer—Make sure to provide users with the installer for this application. To obtain the installer, choose **Application > Plugins** from Cisco Unified Communications Manager Administration and click **Download**, which is located next to the **Cisco Unified IP Phone Address Book Synchronizer** plugin name. When the file download dialog box displays, click **Save**. Send the TabSyncInstall.exe file to all users who require this application.

See the "Installing and Configuring the Cisco Unified IP Phone Address Book Synchronizer" section on page A-3 for information about installing the Cisco Unified IP Phone Address Book Synchronizer.

Installing and Configuring the Cisco Unified IP Phone Address Book Synchronizer

Use this tool to synchronize data stored in your Microsoft Windows address book with the Cisco Unified Communications Manager directory and the User Options Personal Address Book.

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Tip   To successfully synchronize the Windows address book with the Personal Address Book, all Windows address book users should be entered in the Windows address book before performing the following procedures.

Installing the Synchronizer

Step 1   Download the Cisco Unified IP Phone Address Book Synchronizer installer file.

Step 2   Double-click the TabSyncInstall.exe file provided by your system administrator.

The publisher dialog box displays.

Step 3   Click **Run**.

The Welcome to the InstallShield Wizard for Cisco Unified CallManager Personal Address Book Synchronizer window displays.

Step 4   Click **Next**.

The License Agreement window displays.

Step 5   Read the license agreement information, and click the I Accept radio button. Click **Next**.

The Destination Location window displays.

Step 6   Choose the directory in which you want to install the application and click **Next**.

The Ready to Install window displays.

Step 7   Click **Install**.

The installation wizard installs the application to your computer. When the installation is complete, the InstallShield Wizard Complete window displays.

Step 8   Click **Finish**.

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Step 9 To complete the process, follow the steps in the .

Configuring the Synchronizer

Step 1 Open the Cisco Unified IP Phone Address Book Synchronizer.

If you accepted the default installation directory, you can open the application by choosing **Start > All Programs > Cisco Systems > TabSync**.

Step 2 To configure user information, click the **User** button.

The Cisco Unified CallManager User Information window displays.

Step 3 Enter the Cisco Unified IP Phone user name and password and click **OK**.

Step 4 To configure Cisco Unified Communications Manager server information, click the **Server** button.

The Configure Cisco Unified CallManager Server Information window displays.

Step 5 Enter the IP address or host name and the port number of the Cisco Unified Communications Manager server and click **OK**.

If you do not have this information, contact your system administrator.

Step 6 To start the directory synchronization process, click the **Synchronize** button.

The Synchronization Status window provides information on the status of the address book synchronization. If you chose the user intervention for duplicate entries rule and you have duplicate address book entries, the Duplicate Selection window displays. Choose the entry that you want to include in your Personal Address Book and click **OK**.

When synchronization completes, click **Exit** to close the Cisco Unified CallManager Address Book Synchronizer. To verify if the synchronization worked, log in to your User Options web pages and choose Personal Address Book. The users from your Windows address book should be listed.

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Supporting International Users

Translated and localized versions of the Cisco Unified IP Phones are available in several languages. If you are supporting Cisco Unified IP Phones in a non–English environment, refer to the following sections to ensure that the phones are set up properly for your users:

- Installing the Cisco Unified CM Locale Installer, page B-A
- Support for International Call Logging, page B-A

For information on changing the language that is displayed on the User Options web page or the phone, refer to *Cisco Unified IP Phone 6921, 6941, and 6961 User Guide for Cisco Unified Communications Manager 8.0*.

Installing the Cisco Unified CM Locale Installer

If you are using Cisco Unified IP phones in a locale other than English (United States), you must install the locale-specific version of the Cisco Unified CM Locale Installer on every Cisco Unified CM server in the cluster. Installing the locale installer ensures that you have the latest translated text, user and network locales, and country-specific phone tones available for the Cisco Unified IP Phones. You can find locale-specific versions of the Cisco Unified CM Locale Installer at http://www.cisco.com/kobayashi/sw-center/telephony/callmgr/locale-installer.shtml.

For more information, refer to the "Locale Installation" section in the "Software Upgrades" chapter in the *Cisco Unified Communications Operating System Administration Guide*.

Note All languages may not be immediately available, so continue to check the website for updates.

Support for International Call Logging

If your phone system is configured for international call logging, the call logs, redial, or call directory entries may display a "+" symbol to represent the international escape code for your location. Depending on the configuration for your phone system, the "+" may be replaced with the correct international dialing code, or you may need to edit the number before dialing to manually replace the "+" with the international escape code for your location. In addition, while the call log or directory entry may display the full international number for the received call, the phone display may show the shortened local version of the number, without international or country codes.

Technical Specifications

The following sections describe the technical specifications for the Cisco Unified IP Phone 6921, 6941, and 6961.

- Physical and Operating Environment Specifications, page C-1
- Cable Specifications, page C-2
- Network and Access Port Pinouts, page C-2

Physical and Operating Environment Specifications

Table C-1 shows the physical and operating environment specifications for the Cisco Unified IP phones 6921, 6941, and 6961.

Table C-1 **Physical and Operating Specifications**

Specification	Value or Range
Operating temperature	23° to 113°F (–5° to 45°C)
Operating relative humidity	10% to 90% (non-condensing)
Storage temperature	–13° to 176°F (–25° to 80°C)
Height	7.3 in. (18.57 cm)
Width	5.8 in. (14.79 cm)
Depth	7.1 in. (18.05 cm)
Weight	2.2 lb (1.0 kg)
Power	• 100-240 VAC, 50-60 Hz, 0.5 A—when using the AC adapter • 48 VDC, 0.2 A—when using the in-line power over the network cable
Cables	Category 3/5/5e for 10-Mbps cables with 4 pairs Category 5/5e for 100-Mbps cables with 4 pairs **Note** Cables have 4 pairs of wires for a total of 8 conductors.
Distance Requirements	As supported by the Ethernet Specification, it is assumed that the maximum cable length between each Cisco Unified IP Phone and the switch is 100 meters (330 feet).

Cable Specifications

- RJ-9 jack (4-conductor) for handset and headset connection.

- RJ-45 jack for the LAN 10/100BaseT connection (labeled 10/100 SW on the Cisco Unified IP Phone 6921, 6941, and 6961).

- RJ-45 jack for a second 10/100BaseT compliant connection (labeled 10/100 PC on the Cisco Unified IP Phone 6921, 6941, and 6961).

- 48-volt power connector.

Network and Access Port Pinouts

Although both the network and access ports are used for network connectivity, they serve different purposes and have different port pinouts.

- The network port is labeled `network` on the Cisco Unified IP Phone.

- The access port is labeled `Computer` on the Cisco Unified IP Phone.

Network Port Connector

Table C-2 describes the network port connector pinouts.

Table C-2   Network Port Connector Pinouts

Pin Number	Function
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_DB-
7	BI_DD+
8	BI_DD-

Note   "BI" stands for bidirectional, while DA, DB, DC and DD stand for "Data A", "Data B", "Data C" and "Data D", respectively.

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Access Port Connector

Table C-3 describes the access port connector pinouts.

Table C-3   Access Port Connector Pinouts

Pin Number	Function
1	BI_DB+
2	BI_DB-
3	BI_DA+
4	BI_DD+
5	BI_DD-
6	BI_DA-
7	BI_DC+
8	BI_DC-

Note   "BI" stands for bi-directional, while DA, DB, DC and DD stand for "Data A", "Data B", "Data C" and "Data D", respectively.

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Basic Phone Administration Steps

This appendix provides minimum, basic configuration steps for you to do the following:

- Add a new user to Cisco Unified CM Administration
- Configure a new phone for that user
- Associate that user to that phone
- Complete other basic end-user configuration tasks

The procedures provide one method for performing these tasks and are not the only way to perform these tasks. They are a streamlined approach to get a new user and corresponding phone running on the system.

These procedures are designed to be used on a mature Cisco Unified CM system where calling search spaces, partitions, and other complicated configuration have already been done and are in place for existing users.

This section contains these topics:

Example User Information for these Procedures

In the procedures that follow, example are given when possible to illustrate some of the steps. Sample user and phone information used throughout these procedures includes:

- User's Name: John Doe
- User ID: johndoe
- Phone model: 6921
- Protocol: SCCP
- MAC address listed on phone: 00127F576611
- Five-digit internal telephone number: 26640

Adding a User to Cisco Unified CM

This section describes steps for adding a user to Cisco Unified CM. Follow one of the procedures in this section, depending on your operating system and the manner in which you are adding the user:

Adding a User From an External LDAP Directory

If you added a user to an LDAP Directory (a non–Cisco Unified Communications Server directory), you can immediately synchronize that directory to the Cisco Unified CM on which you are adding this same user and the user's phone by following these steps.

Procedure

Step 1   Log onto Cisco Unified Communications Manager Administration.

Step 2   Choose **System > LDAP > LDAP Directory**.

Step 3   Use the **Find** button to locate your LDAP directory.

Step 4   Click on the LDAP directory name.

Step 5   Click **Perform Full Sync Now**.

If you do not need to immediately synchronize the LDAP Directory to the Cisco Unified Communications Manager, the LDAP Directory Synchronization Schedule on the LDAP Directory window determines when the next auto-synchronization is scheduled. However, the synchronization must occur before you can associate a new user to a device.

Step 6   Proceed to .

Adding a User Directly to Cisco Unified Communications Manager

If you are not using an LDAP directory, you can add a user directly to Cisco Unified Communications Manager Administration by following these steps:

Procedure

Step 1   Choose **User Management > End User**, then click **Add New.** The End User Configuration window appears.

Step 2   In the User Information pane of this window, enter the following:

- User ID—Enter the end user identification name. Cisco Unified Communications Manager does not permit modifying the user ID after it is created. You may use the following special characters: =, +, <, >, #, ;, \, , "", and blank spaces.

   Example: *johndoe*

  – Password and Confirm Password—Enter five or more alphanumeric or special characters for the end user password. You may use the following special characters: =, +, <, >, #, ;, \, , "", and blank spaces.

  – Last Name—Enter the end user last name. You may use the following special characters: =, +, <, >, #, ;, \, , "", and blank spaces.

    Example: *doe*

  – Telephone Number—Enter the primary directory number for the end user. End users can have multiple lines on their phones.

    Example: 26640 (John Doe's internal company telephone number)

Step 3   Click **Save**.

Step 4   Proceed to the section .

Configuring the Phone

To identify the user's phone model and protocol, follow these steps.

Procedure

Step 1   From Cisco Unified Communications Manager administration, choose **Device > Phone >.**

Step 2   Click **Add New**.

Step 3   Select the user's phone model from the Phone Type drop-down list, then click **Next**. The Phone Configuration window appears.

On the Phone Configuration window, you can use the default values for most of the fields.

To configure the required fields and some key additional fields, follow these steps.

Procedure

Step 1   For the required fields, possible values, some of which are based on the example of user *johndoe*, can be configured as follows:

  a. In the Device Information pane of this window:

  – MAC Address—Enter the MAC address of the phone, which is listed on a sticker on the phone.

    Make sure that the value comprises 12 hexadecimal characters.

    Example: 00127F576611 (MAC address on john doe's phone)

  – Description—This is an optional field in which you can enter a useful description, such as *john doe's phone*. This will help you if you need to search on information about this user.

  – Device Pool—Choose the device pool to which you want this phone assigned. The device pool defines sets of common characteristics for devices, such as region, date/time group, softkey template, and MLPP information.

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> **Note**   Device Pools are defined on the Device Pool Configuration window of Cisco Unified Communications Server Administration (**System > Device Pool**).

- Phone Button Template—Choose the appropriate phone button template from the drop-down list. The phone button template determines the configuration of buttons on a phone and identifies which feature (line, speed dial, and so on) is used for each button.

  Phone button templates are defined on the Phone Button Template Configuration window of Cisco Unified Communications Manager Administration (**Device > Device Settings > Phone Button Template**). You can use the search field(s) in conjunction with the **Find** button to find all configured phone button templates and their current settings.

- Softkey Template—Choose the appropriate softkey template. The softkey template determines the configuration of the softkeys on Cisco Unified IP Phones. Leave this field blank if the common device configuration contains the assigned softkey template.

  Softkey templates are defined on the Softkey Template Configuration window of Cisco Unified Communications Manager Administration (**Device > Device Settings > Softkey Template**). You can use the search field(s) in conjunction with the **Find** button to find all configured softkey templates and their current settings.

- Common Phone Profile—From the drop-down list box, choose a common phone profile from the list of available common phone profiles.

  Common Phone Profiles are defined on the Common Phone Profile Configuration window of Cisco Unified Communications Manager Administration (**Device > Device Settings > Common Phone Profile**). You can use the search field(s) in conjunction with the **Find** button to find all configured common phone profiles and their current settings.

- Calling Search Space—From the drop-down list box, choose the appropriate calling search space (CSS). A calling search space comprises a collection of partitions (analogous to a collection of available phone books) that are searched to determine how a dialed number should be routed. The calling search space for the device and the calling search space for the directory number get used together. The directory number CSS takes precedence over the device CSS.

  Calling Search Spaces are defined on the Calling Search Space Configuration window of Cisco Unified Communications Manager Administration (**Calling routing > Class of Control> Calling Search Space**). You can use the search field(s) in conjunction with the **Find** button to find all configured Calling Search Spaces and their current settings.

- Location—Choose the appropriate location for this Cisco Unified IP Phone.

- Owner User ID—From the drop-down menu, choose the user ID of the assigned phone user.

b. In the Protocol Specific Information pane of this window, choose a Device Security Profile from the drop-down list. To enable security features for a phone, you must configure a new security profile for the device type and protocol and apply it to the phone. If the phone does not support security, choose a non-secure profile.

To identify the settings that are contained in the profile, choose **System > Security Profile > Phone Security Profile**.

The security profile chosen should be based on the overall security strategy of the company.

c. In the Extension Information pane of this window, check the Enable Extension Mobility box if this phone supports Cisco Extension Mobility.

d. Click **Save**.

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Step 2 Configure line settings:

a. On the Phone Configuration window, click Line 1 on the left pane of the window. The Directory Number Configuration window appears.

b. In the Directory Number field, enter a valid number that can be dialed.

This field should contain the same number that appears in the Telephone Number field on the User Configuration window.

Example: 26640 is the directory number of user John Doe in the example above.

c. From the Route Partition drop-down list, choose the partition to which the directory number belongs. If you do not want to restrict access to the directory number, choose <None> for the partition.

d. From the Calling Search Space drop-down list (Directory Number Settings pane of the Directory Number Configuration window), choose the appropriate calling search space. A calling search space comprises a collection of partitions that are searched for numbers that are called from this directory number. The value that you choose applies to all devices that are using this directory number.

e. In the Call Pickup and Call Forward Settings pane of the Directory Number Configuration window, choose the items (i.e. Forward All, Forward Busy Internal) and corresponding destinations to which calls should be sent.

Example: If you want incoming internal and external calls that receive a busy signal to be forwarded to the voice mail for this line, check the Voice Mail box next to the "Forward Busy Internal" and "Forward Busy External" items in the left column of the Call Pickup and Call Forward Settings pane.

f. In the "Line 1 on Device..." pane of the Directory Number Configuration window, configure the following:

– Display (Internal Caller ID field)—You can enter the first name and last name of the user of this device so that this name will be displayed for all internal calls. You can also leave this field blank to have the system display the phone extension.

– External Phone Number Mask—Indicate phone number (or mask) that is used to send Caller ID information when a call is placed from this line.

You can enter a maximum of 24 number and "X" characters. The Xs represent the directory number and must appear at the end of the pattern.

Example: Using the john doe extension in the example above, if you specify a mask of 408902XXXX, an external call from extension 6640 displays a caller ID number of 4089026640.

> **Note** This setting applies only to the current device unless you check the check box at right (Update Shared Device Settings) and click the **Propagate Selected** button. (The check box at right displays only if other devices share this directory number.)

g. Click **Save**.

h. Click **Associate End Users** at the bottom of the window to associate a user to the line being configured. Use the Find button in conjunction with the Search fields to locate the user, then check the box next to the user's name, then click **Add Selected**. The user's name and user ID should now appear in the "Users Associated With Line" pane of the Directory Number Configuration window.

i. Click **Save**. The user is now associated with Line 1 on the phone.

j. If your phone has a second line, configure Line 2.

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k. Associate the user with the device:

- Choose **User Management > End User**.

- Use the search boxes and the Find button to locate the user you have added (i.e. *doe* for the last name).

- Click on the user ID (i.e. *johndoe*). The End User Configuration window appears.

- Click **Device Associations**.

- Use the Search fields and the Find button to locate the device with which you want to associate to the user. Select the device, then click **Save Selected/Changes**. The user is now associated with the device.

- Click the **Go** button next to the "Back to User" Related link in the upper-right corner of the screen.

l. Proceed to .

Performing Final End User Configuration Steps

If you are not already on the End User Configuration page, choose **User Management > End User** to perform some final configuration tasks. Use the Search fields and the Find button to locate the user (i.e. John Doe), then click on the user ID to get to the End User Configuration window for the user.

In the End User configuration window, do the following:

Procedure

Step 1 In the Directory Number Associations pane of the screen, set the primary extension from the drop-down list.

Step 2 In the Mobility Information pane, check the Enable Mobility box.

Step 3 In the Permissions Information pane, use the User Group buttons to add this user to any user groups. For example, you may want to add the user to a group that has been defined as a "Standard CCM End User Group."

To view all configured user groups, choose **User Management > User Group**.

Step 4 Click **Save**.

Installing the Wall Mount Kit for the Cisco Unified IP Phones 6921, 6941, and 6961

This appendix contains information on installing the wall mount for use with the Cisco Unified IP Phones 6921, 6941, and 6961.

Figure E-1   Wall Mount Kit
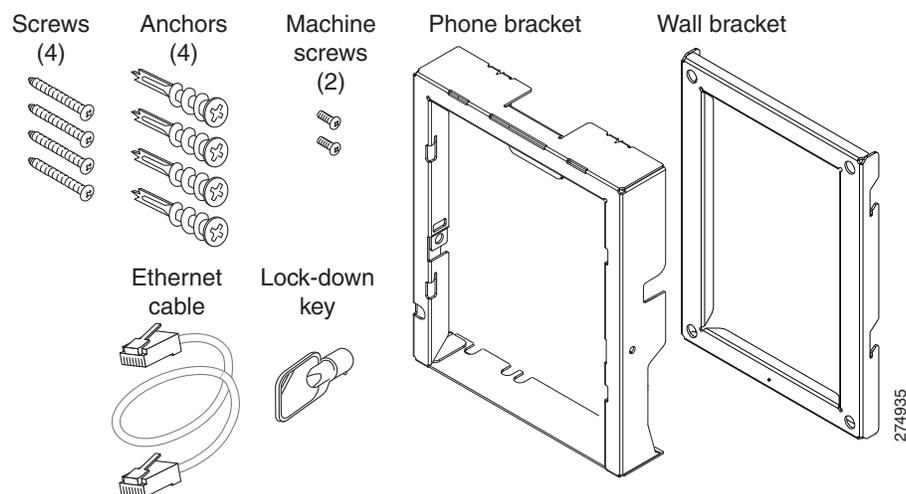
The package includes these items:

- One phone bracket
- One wall bracket
- Four 10-12x1 inch Phillips-head screws with 4 anchors
- Two 4-40x1/4 inch machine screws
- One 6-inch Ethernet cable
- One key if the bracket includes the optional lock

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Before You Begin

You will need these tools to install the bracket:

- #1 and #2 Phillips-head screwdrivers
- Level

You must also install an Ethernet jack for the telephone in the desired location if an Ethernet jack does not currently exist. This jack must be wired appropriately for an Ethernet connection. You cannot use a regular telephone jack. For more information on phone installation requirements and warnings, see the Setting Up the Cisco Unified IP Phone chapter.

Installing the Bracket

To install the phone on the wall, perform the following steps:

Procedure

Step 1   Mount the wall bracket in the desired location (Figure E-2). You can install the bracket over an Ethernet jack, or you can run the Ethernet network cable to a jack nearby.

    a. Use the level to ensure the bracket is level, then use a pencil to mark the screw holes.

    b. Using a #2 Phillips-head screwdriver, carefully center the anchor over the pencil mark and press the anchor into the wall.

    c. Screw the anchor clockwise into the wall until it is seated flush.

    d. Use the included screws and a #2 Phillips-head screwdriver to attach the bracket to the wall.

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Figure E-2   Mounting the Wall Bracket

A — Level wall bracket on wall

B — Mark mounting holes through bracket on wall

C — Insert anchors into wall

D — Screw bracket to wall using Phillips head screws

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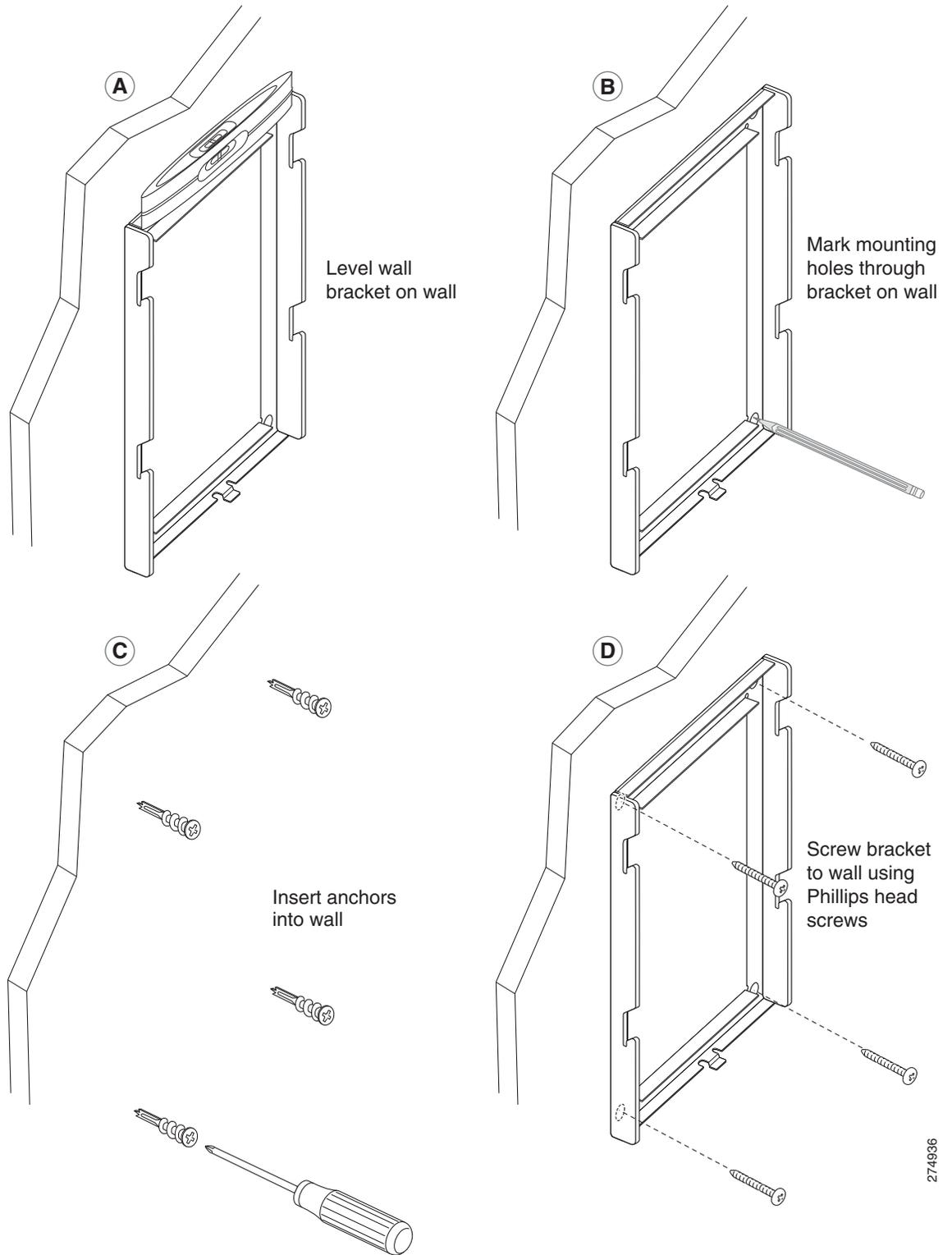
Step 2   Attach the phone bracket to the IP phone (Figure E-3).

a.   Detach the handset cord (and headset cord, if there is a headset), power cord, and any other attached cords from the base of the phone.

b.   Remove the label covers that are concealing the screw holes.

c.   Attach the phone bracket by inserting the tabs into the mounting tabs on the phone. The phone's ports should be accessible through the holes in the bracket.

d.   Secure the phone bracket to the IP Phone with the machine screws.

e.   Thread the handset cord (and headset cord, if using one). Reattach the cords and seat them in the clips incorporated into the phone body.

Figure E-3   *Attaching the Phone Bracket*
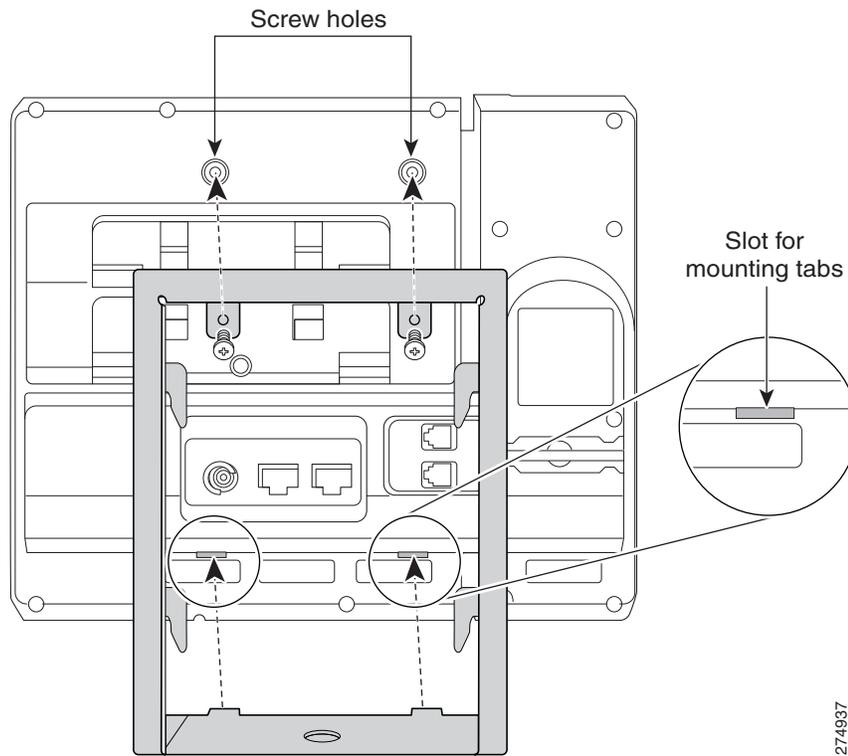
Step 3   Remove the handset wall hook in the handset rest, rotate the hook 180 degrees, and reinsert the hook. The hook should have a lip on which the handset catches when the phone is vertical (Figure E-4).

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Figure E-4   Preparing the Handset Hook
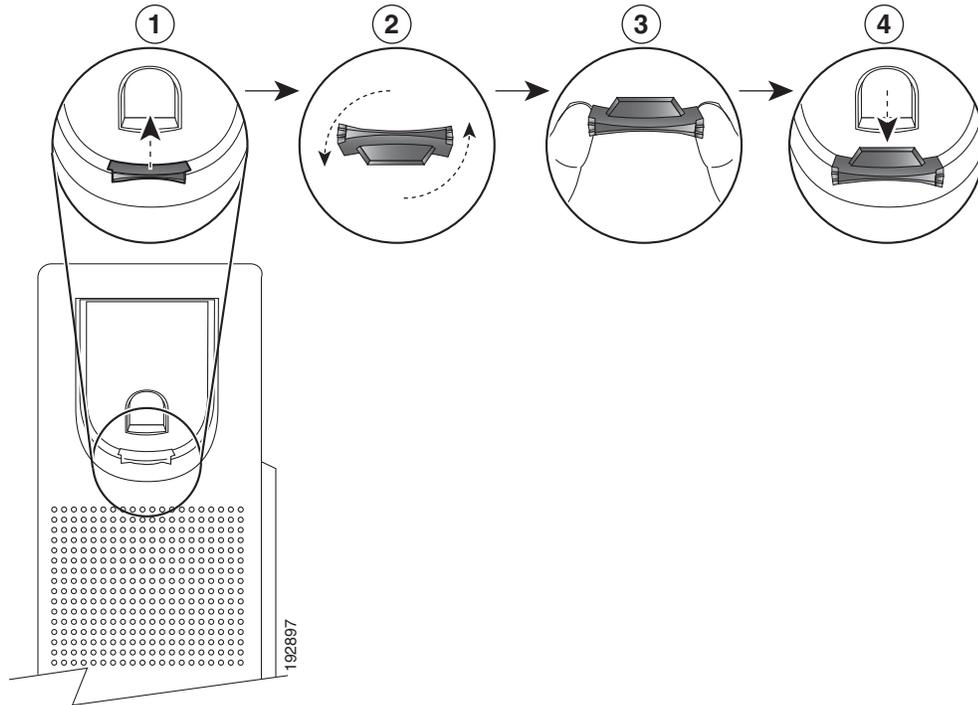
Step 4   Attach the Ethernet cable to the 10/100 SW network port and wall jack.

If you are connecting a network device (such as a computer) to the phone, attach the cable to the 10/100 PC access port.

If you are using an external power supply, plug the power cord into the phone and dress the cord by clipping it into the clips incorporated into the phone body next to the 10/100 PC port (Figure E-5).

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Figure E-5   *Attaching the Cables*
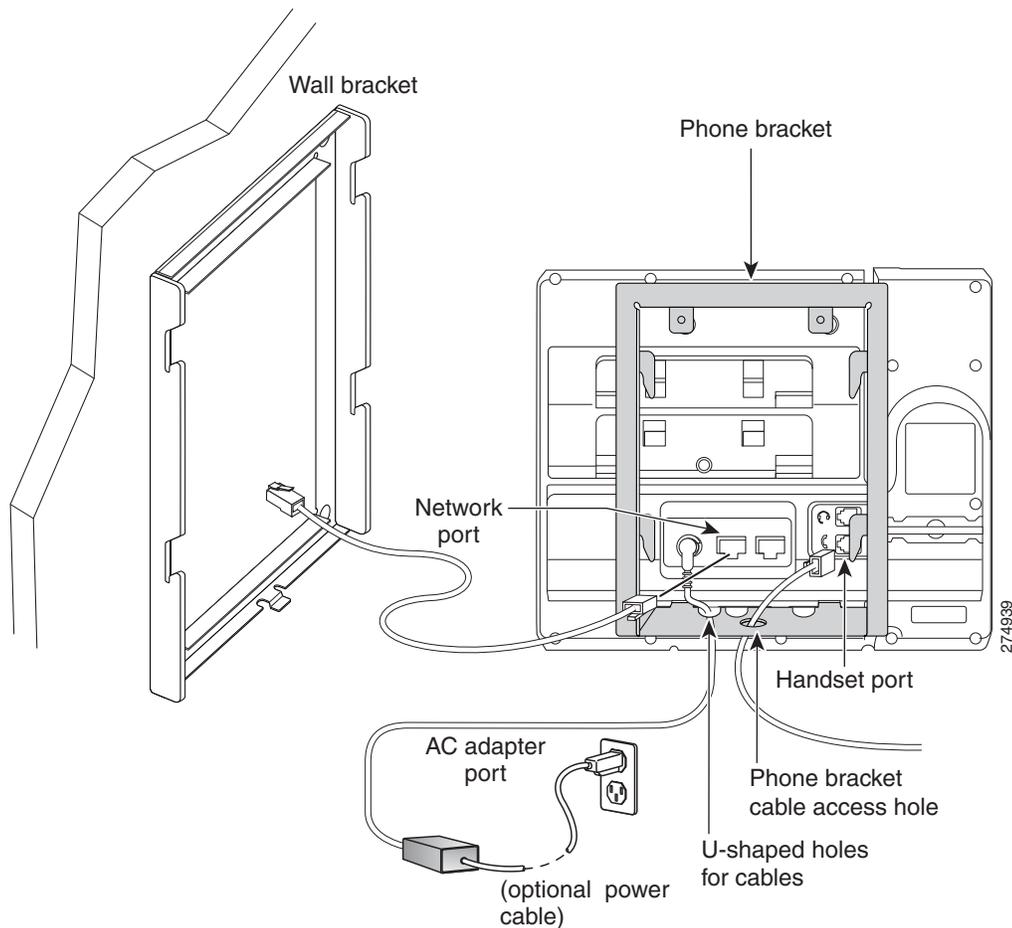
Step 5   Attach the phone to the wall bracket by inserting the tabs on the top of the phone bracket into the slots on the wall bracket. Ensure that the power cord and any other cable that does not terminate in the wall behind the bracket are positioned in one of the cable-access openings in the bottom of the bracket. The phone and wall brackets' openings together form circular openings with room for one cable per opening (Figure E-6).

Step 6   Use the locking key to lock the phone to the wall bracket.

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Figure E-6   *Attaching the Phone to the Wall Bracket*

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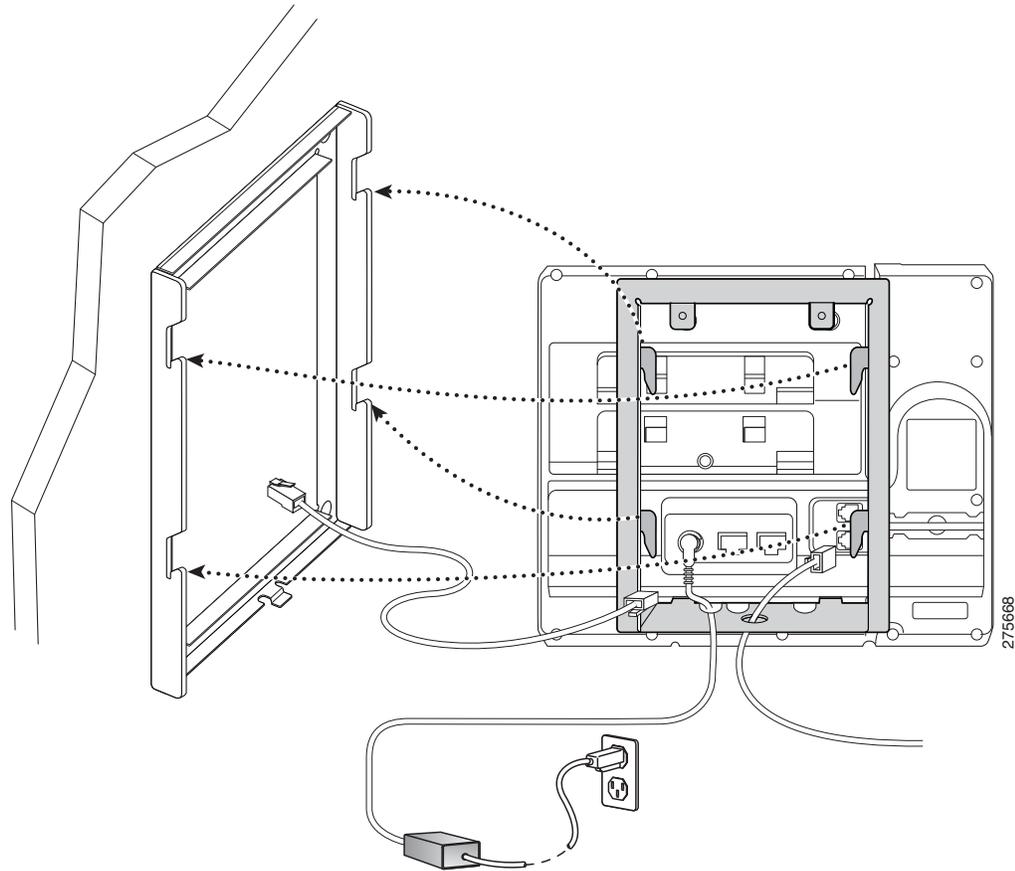
Cisco Unified IP Phone Non-Lockable Wall Mount

This appendix contains information on installing the following product:

- ADA Non-Lockable Wall Mount Kit for 6900 Series: Installed on the Cisco Unified IP Phone 6911, 6921, 6941, 6945, and 6961.

This nonlocking wall mount kit meets ADA 4.4.1 requirements.

ADA Non-Lockable Wall Mount Kit for 6900 Series

This section describes how to install the ADA Non-Lockable Wall Mount Kit for 6900 Series on a Cisco Unified IP Phone 6911, 6921, 6941, 6945, and 6961.

The following figure shows the wall mount kit installed on the phone.

Figure F-1   Back View of ADA Non-Lockable Wall Mount Kit Installed on Phone

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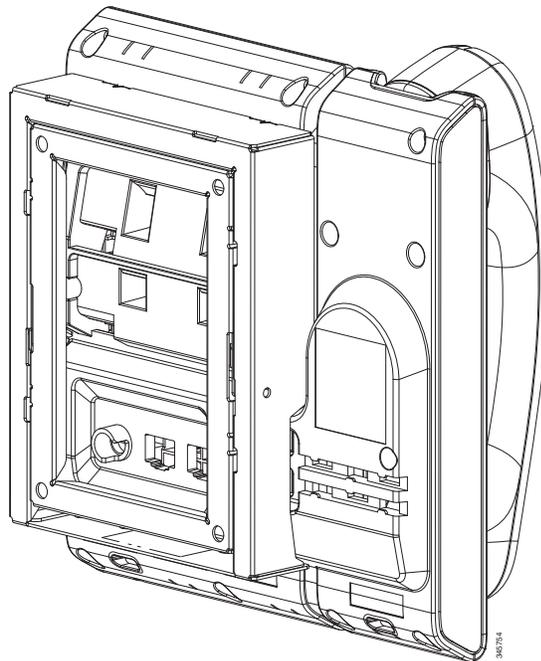
The following figure shows the phone with the wall mount kit from the side.

Figure F-2   *Side View of ADA Non-Lockable Wall Mount Kit Installed on Phone*
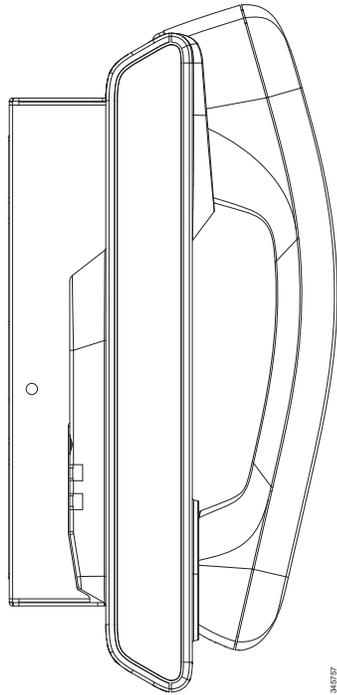
Components

The following figure shows the contents of the Wall Mount kit.

Figure F-3   *Components*
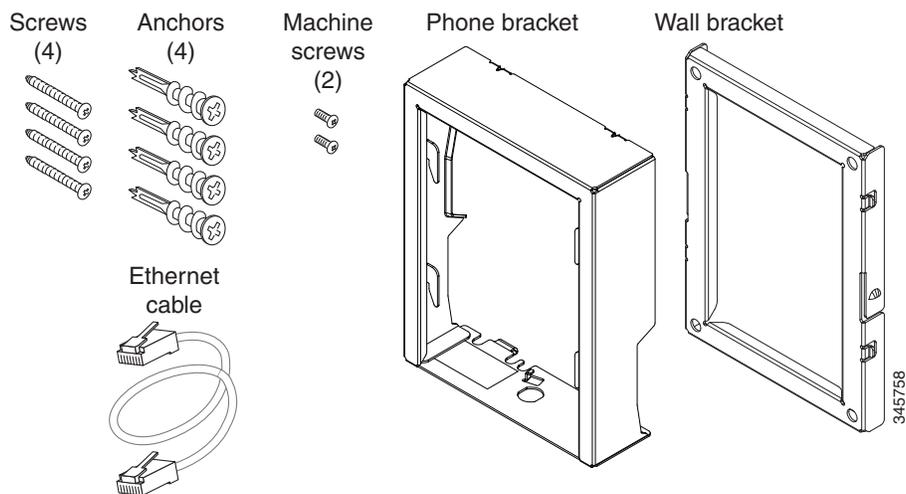
The package includes these items:

- One phone bracket
- One wall bracket
- Four #8-18 x 1.25-inch Phillips-head screws with four anchors
- Two M2.5 x 6 mm machine screws
- One 6-inch Ethernet cable

Before You Begin

You need these tools to install the bracket:

- #1 and #2 Phillips-head screwdrivers
- Level
- Pencil

You must also install an Ethernet jack for the telephone in the desired location if an Ethernet jack does not currently exist. This jack must be wired appropriately for an Ethernet connection. You cannot use a regular telephone jack. For more information about phone installation requirements and warnings, see Setting Up the Cisco Unified IP Phone, page 3-1.

Install Non-Lockable Wall Mount Kit for Phone

Step 1   Mount the wall bracket in the desired location. You can install the bracket over an Ethernet jack, or you can run the Ethernet network cable to a jack nearby.

    a.   Hold the bracket on the wall, placing it so that the arrow on the back of the bracket is pointing up.

    b.   Use the level to ensure the bracket is level and use a pencil to mark the screw holes.

    c.   Use a #2 Phillips-head screwdriver to carefully center the anchor over the pencil mark and press the anchor into the wall.

    d.   Screw the anchor clockwise into the wall until it is seated flush.

    e.   Use the included screws and a #2 Phillips-head screwdriver to attach the bracket to the wall.

The following figure shows the steps to mount the wall bracket.

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Figure F-4   ***Mount the Wall Bracket***
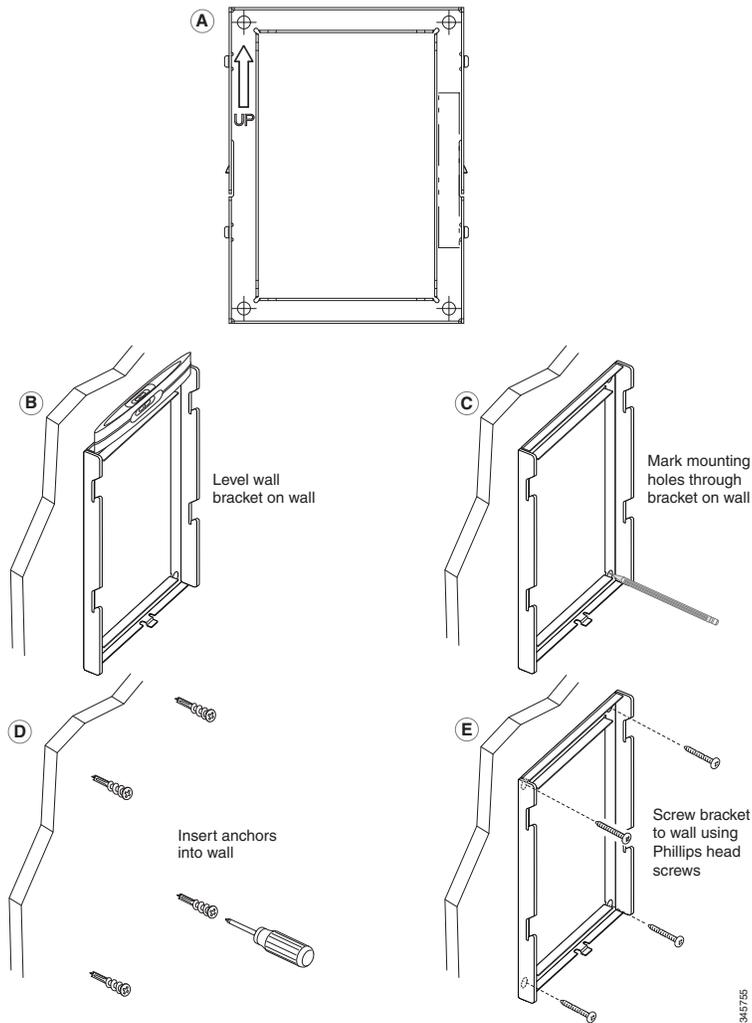
Step 2   Attach the phone bracket to the IP phone.

    a.   Detach the handset cord (and headset cord, if there is a headset), power cord, and any other attached cords from the base of the phone.

    b.   Remove the label covers that are concealing the screw holes.

    c.   Attach the phone bracket by inserting the tabs into the mounting tabs on the phone. The phone ports should be accessible through the holes in the bracket.

    d.   Secure the phone bracket to the IP Phone with the machine screws.

    e.   Thread the handset cord (and headset cord, if using one). Reattach the cords and seat them in the clips incorporated into the phone body.

The following figure shows how to attach the phone bracket.

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Figure F-5   ***Attach Phone Bracket***
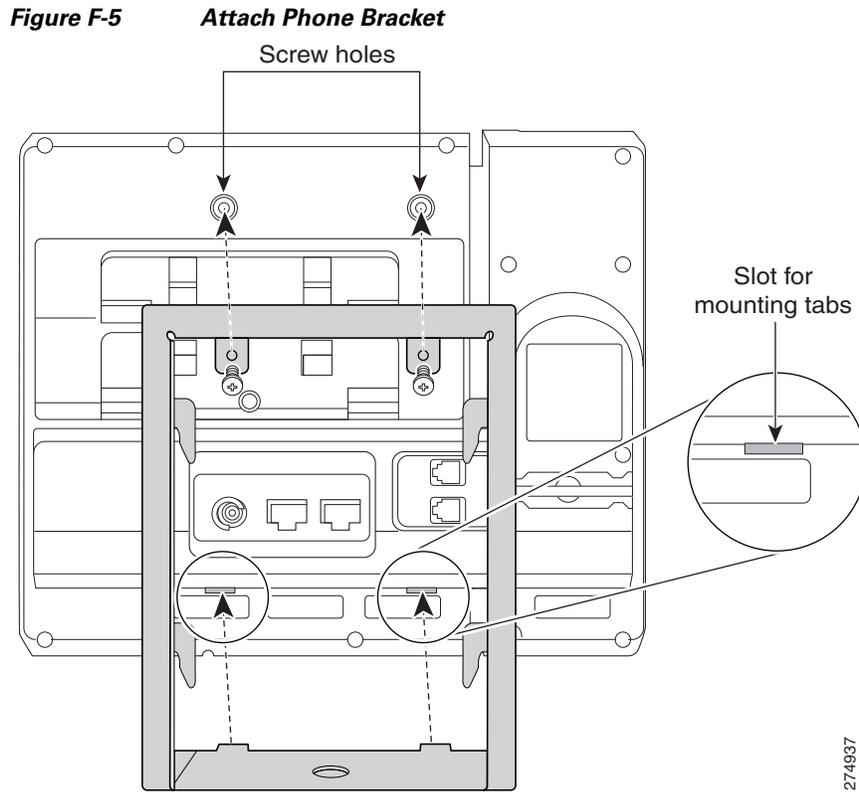
Step 3   Attach the cables.

     a.   Attach the Ethernet cable to the 10/100 SW network port and wall jack.

     b.   (Optional) If you are connecting a network device (such as a computer) to the phone, attach the cable to the 10/100 PC access port.

     c.   (Optional) If you are using an external power supply, plug the power cord into the phone and dress the cord by clipping it into the clips incorporated into the phone body next to the 10/100 PC port.

     The following figure shows the cable attachment.

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Figure F-6   *Attach Cables*
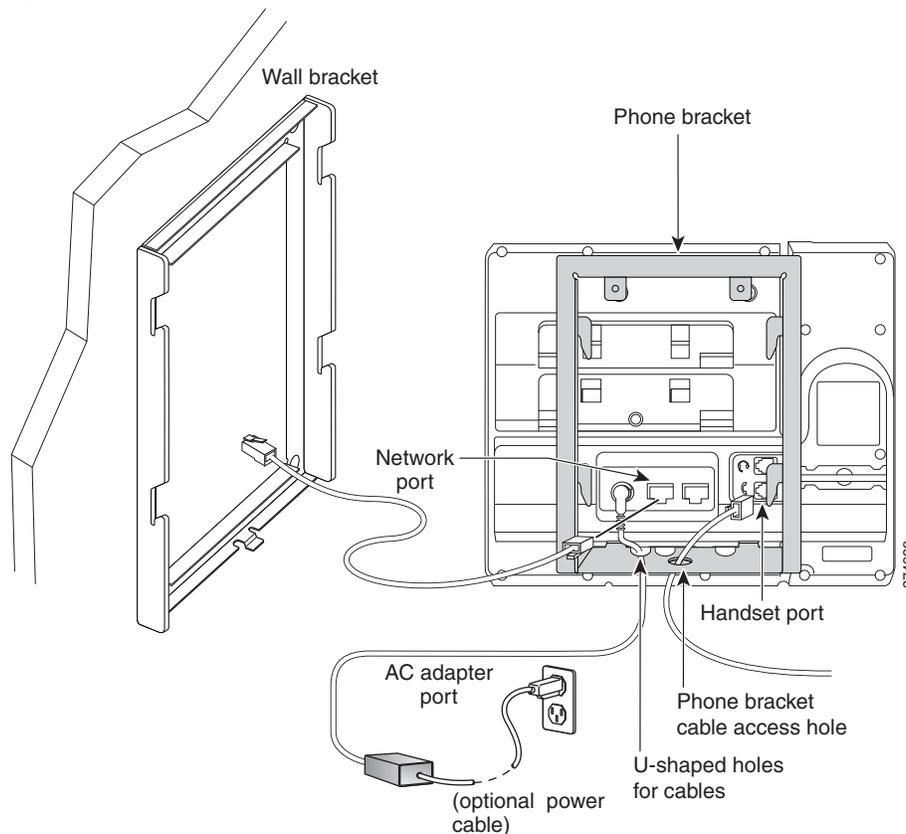
Step 4   Attach the phone to the wall bracket by inserting the tabs on the top of the phone bracket into the slots on the wall bracket.

Use the cable-access openings in the bottom of the bracket to position the power cord and any other cable that does not terminate in the wall behind the bracket. The phone and wall bracket openings together form circular openings with room for one cable per opening.

Step 5   Proceed to Step 3 of Installing the Bracket, page E-2.

Remove Phone from Non-Lockable Wall Mount

The phone mounting plate contains two tabs to lock the plate into the wall bracket. The following figure shows the location and shape of the tabs.

The following figure shows the tab location.

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Figure F-7 **Tab Location**
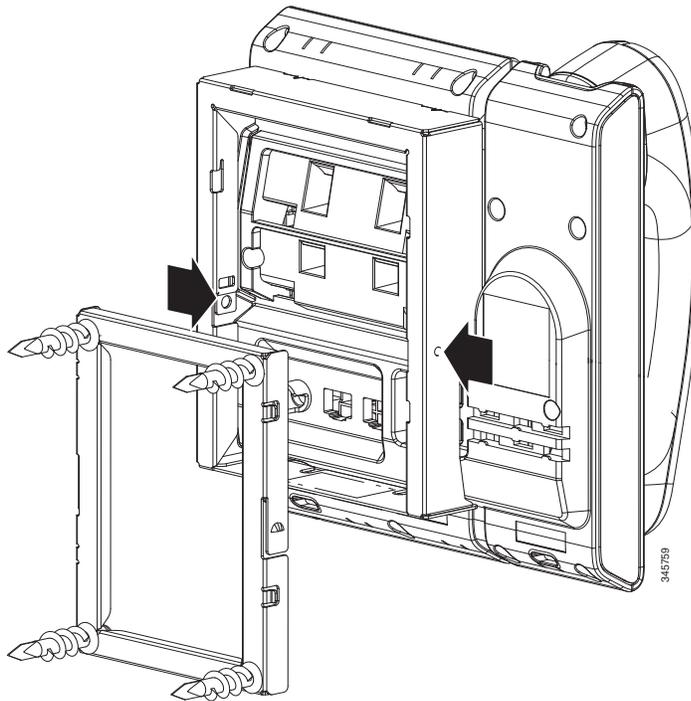
To remove the phone and mounting plate from the wall bracket, you must disengage these tabs.

Before You Begin

You require two screwdrivers or metal sticks.

Step 1	Push the screw drivers into the left and right holes in the phone mounting plate approximately 1 in. (2.5 cm).
Step 2	Press firmly inwards (towards the phone) to disengage the tabs, lift up on the phone to release the phone from the wall bracket, and then pull the phone towards you.

The following figure shows how to disengage the tabs.

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Figure F-8 **Disengage tabs**

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