Cisco Unified SIP Phone 3911 Administration Guide for Cisco Unified Communications Manager 6.0 and 5.1

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• Move the equipment farther away from the television or radio.

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Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.

Cisco Unified SIP Phone 3911 Administration Guide for Cisco Unified Communications Manager

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Preface

Overview

The *Cisco Unified SIP Phone 3911 Administration Guide for Cisco Unified Communications Manager 6.0 and 5.1* 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 a Unified Communications network, this guide does not provide complete and detailed information for procedures that you need to perform in Cisco Unified Communications Manager (formerly Cisco Unified CallManager) or other network devices.

Audience

Network engineers, system administrators, or telecom engineers should review this guide to learn the steps required to properly set up the Cisco Unified SIP Phone 3911 on the network.

The tasks described are considered to be 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 Communications Manager, many of the tasks in this manual require familiarity with Cisco Unified Communications Manager.

Objectives

This guide provides the required steps to get the Cisco Unified IP Phone up and running on a Voice-over-IP (VoIP) network.

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 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 properly and safely install and configure the Cisco Unified IP Phone on your network.
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 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, "Viewing Status, Statistics, and Firmware Information on the Cisco Unified IP Phone"	Provides an overview of procedures for configuring telephony features and adding users to Cisco Unified Communications Manager.
Chapter 7, "Troubleshooting and Maintenance"	Provides tips for troubleshooting the Cisco Unified IP Phones and the Expansion Module.

Chapter	Description
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.
Index	Provides reference information.

Related Documentation

For more information about Cisco Unified IP Phones or Cisco Unified Communications Manager, refer to the following publications:

Cisco Unified SIP Phones 3900 series

http://www.cisco.com/en/US/products/ps7193/tsd_products_support_series_home.html

- *Cisco Unified SIP Phone 3911 Phone Guide for Cisco Unified Communications Manager 6.0 and 5.1*
- *Cisco Unified SIP Phone 3911 Installation Guide*
- *Cisco United SIP Phone 3911 Release Notes*

Cisco Unified Communications Manager

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 about obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and 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

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.
`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.

Warning **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.**

CHAPTER 1

An Overview of the Cisco Unified IP Phone

The Cisco Unified SIP Phone 3911 provides voice communication over an Internet Protocol (IP) network. The IP Phone functions like a digital business telephone, allowing you to place and receive phone calls and to access features such as mute, hold, transfer, speed dial, and call forward. The IP Phone also supports security features that include image and digest authentication.

The Cisco Unified SIP Phone 3911 is interoperable with RFC-3261, RFC-3264, RFC-3264, RFC-3311, RFC 3515, and RFC-3891.

An IP Phone, like other network devices, must be configured and managed. These phones support G.711a, G.711u, G.729(decode only), and G.729a. This manual describes the Cisco Unified SIP Phone 3911.

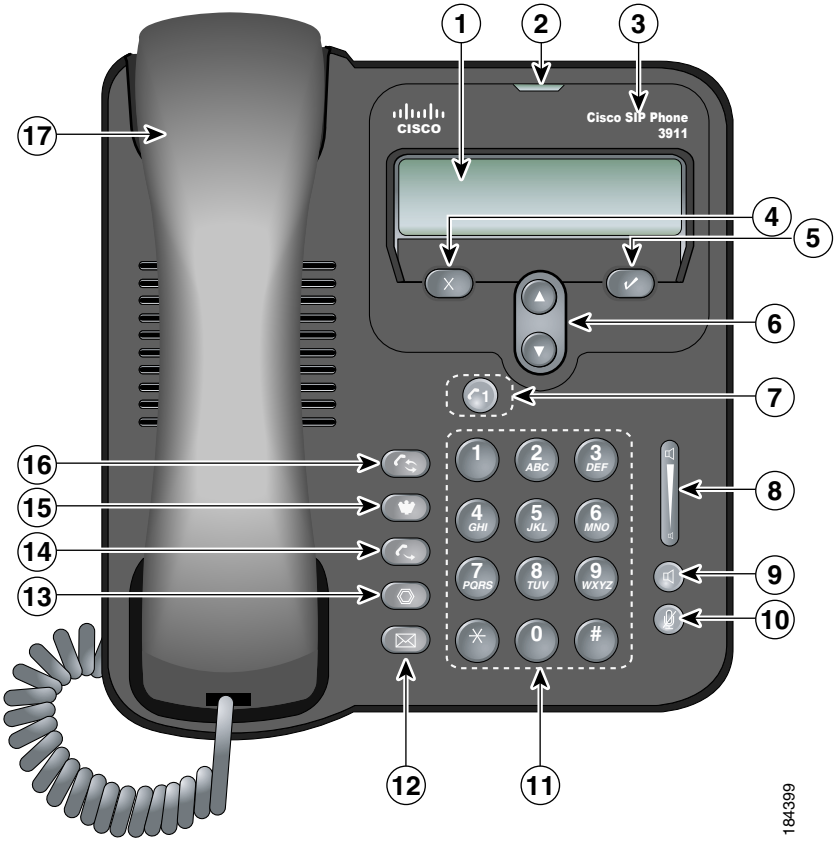
This chapter includes the following topics:

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

Understanding the Cisco Unified SIP Phone 3911

Figure 1-1 shows the main components of the Cisco Unified SIP Phone 3911.

Figure 1-1 Cisco Unified SIP Phone 3911



1	Phone Screen	**10**	Mute Button
2	Message Waiting Indicator	**11**	Keypad
3	Cisco Unified IP Phone Series	**12**	Messages Button
4	Cancel Button	**13**	Hold Button
5	OK Button	**14**	Transfer Button
6	Navigation Bar	**15**	Conference Button
7	Line Button	**16**	Redial Button
8	Volume Button	**17**	HandSet
9	Speaker Button		

What Networking Protocols Are Used?

Cisco Unified IP Phones support several industry-standard and Cisco networking protocols required for voice communication. Table 1-1 provides an overview of the networking protocols supported on the Cisco Unified SIP Phone 3911.

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

Networking Protocol	Purpose	Usage Notes
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.
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 it become operational without you needing to manually assign an IP address or configure additional required 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 DCHP configurations, refer *Cisco Unified Communications Manager System Guide*.
Hypertext Transfer Protocol (HTTP)	HTTP is the standard way of transferring information and moving documents across the Internet and the web.	Cisco Unified SIP Phone 3911 supports HTTP.

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

Networking Protocol	Purpose	Usage Notes
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.
Network Time Protocol (NTP)	NTP is a protocol that is used to synchronize timekeeping among a set of distributed time servers and clients.	When you configure Network Time Protocol (NTP) on Cisco Unified Communications Manager Administration, the Cisco Unified IP phones will get the date and time from an NTP server.
Real-Time Transport (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.
Session Description Protocol (SDP)	SDP is the portion of the SIP protocol that determines which parameters are available during a connection between two endpoints. Conferences are established using only the SDP capabilities that are supported by all endpoints in the conference.	SDP capabilities, such as codec types, DTMF detection, and comfort noise are normally configured on a global basis by the Cisco Unified Communications Manager or the Media Gateway in operation. Some SIP endpoints may allow these parameters to be configured on the endpoint itself.

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

Networking Protocol	Purpose	Usage Notes
Session Initiation Protocol (SIP)	SIP is the Internet Engineering task Force (IETF) standard for multimedia conferencing over IP. SIP is an ASCII-based, application-layer control protocol (defined in RFC 3261) that can be used to establish, maintain, and terminate calls between two or more endpoints.	Like other VoIP protocols, SIP is designed to address the functions of signaling and session management within a packet telephony network. *Signaling* allows call information to be carried across network boundaries. *Session management* provides the ability to control the attributes of an end-to-end call.
Transmission Control Protocol (TCP)	TCP is a connection-oriented transport protocol.	
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 using the Network Configuration menu on the phone.
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.

Related Topics

- Understanding How the Cisco Unified IP Phone Interacts with Cisco Unified Communications Manager, page 2-2
- Understanding the Phone Startup Process, page 2-7
- Configuration Menus on the Cisco Unified IP Phone, page 4-3

What Features are Supported on the Cisco Unified SIP Phone 3911?

The Cisco Unified SIP Phone 3911 functions much like digital business phones, allowing you to place and receive telephone 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 covers the following topics:

Feature Overview

Cisco Unified IP Phones provide traditional telephony functionality, such as call forwarding and transferring, redialing, speed dialing, 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 SIP Phone 3911 so that it can access Cisco Unified Communications Manager 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, and subnet mask. For instructions on configuring the network settings on the Cisco Unified IP Phones, see Chapter 4, "Configuring Settings on the Cisco Unified IP Phone."

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 6, "Viewing Status, Statistics, and Firmware Information on the Cisco Unified IP Phone," for more information.

Related Topics

- Configuring Network Settings, page 4-3
- Configuring Features and Users, page 5-1
- Troubleshooting and Maintenance, page 7-1

Configuring Telephony Features

You can modify additional settings for the Cisco Unified IP Phone from the Cisco Unified Communications Manager Administration application. Use this web-based application to set up phone registration criteria and calling search spaces. See the "Telephony Features Available for the Cisco Unified IP Phone" section on page 5-1, and refer to the Cisco Unified Communications Manager documentation for additional information.

For more information about the Cisco Unified Communications Manager Administration application, refer to Cisco Unified Communications Manager 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 the complete Cisco Unified Communications Manager documentation suite at this location:

http://www.cisco.com/en/US/products/sw/voicesw/ps556/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 6, "Viewing Status, Statistics, and Firmware Information on the Cisco Unified IP Phone."

Related Topics

- Configuring Settings on the Cisco Unified IP Phone, page 4-1
- Troubleshooting and Maintenance, page 7-1

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. Make sure to visit the Cisco Unified IP Phone web site:

http://www.cisco.com/en/US/products/hw/phones/ps379/tsd_products_support_series_home.htm

From this site, you can view access various user guides.

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.

Understanding Security Features for Cisco Unified SIP Phone 3911

Cisco Unified SIP Phone 3911 support the following security feature:

- Digest authentication—When the phone makes any request, Cisco Unified Communications Manager issues a challenge that requires the phone to respond with the correct password.

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 complete Cisco Unified IP telephony network, refer 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 Communications Manager, 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 Communications Manager, page 1-10
- Installing Cisco Unified IP Phones, page 1-14

Configuring Cisco Unified IP Phones in Cisco Unified Communications Manager

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

- Auto-registration
- Cisco Unified Communications Manager Administration
- Cisco Unified Communications Manager Bulk Administration (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 Communications Manager Database" section on page 2-10.

For general information about configuring phones in Cisco Unified Communications Manager, refer to the "Cisco Unified IP Phones" chapter in *Cisco Unified Communications Manager System Guide* and the "Cisco Unified IP Phone Configuration" chapter in *Cisco Unified Communications Manager Administration Guide.*

Checklist for Configuring the Cisco Unified IP Phone in Cisco Unified Communications Manager

Table 1-2 provides an overview and checklist of configuration tasks for the Cisco Unified IP Phone in Cisco Unified Communications Manager 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 1-2 Checklist for Configuring the Cisco Unified SIP Phone 3911 in Cisco Unified Communications Manager

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 • Associated directory number (DN) to assign to the phone • Cisco Unified Communications Manager user to associate with the phone	Provides list of configuration requirements for setting up phones. Identifies preliminary configuration that you need to perform before configuring individual phones.	Refer to *Cisco Unified Communications Manager System Guide,* "Cisco Unified IP Phone" chapter. See the "Telephony Features Available for the Cisco Unified IP Phone" section on page 5-1.

Table 1-2 Checklist for Configuring the Cisco Unified SIP Phone 3911 in Cisco Unified Communications Manager (continued)

Task	Purpose	For More Information
2. Add and configure the phone by completing these required fields in the Phone Configuration window: • Phone type • Description (user name or ID) • MAC address • Device pool • Partition • Calling Search Space	Adds the device with its default settings to the Cisco Unified Communications Manager database.	Refer to *Cisco Unified Communications Manager Administration Guide*, "Cisco Unified IP Phone Configuration" chapter.
3. Add and configure directory number on the phone by completing these required fields in the Directory Number Configuration window: • Directory number • Partition • Multiple Calls and Call Waiting • Call Forwarding • Voice Messaging (if used)	Adds a directory number and features that are associated with a directory number to the phone.	Refer to *Cisco Unified Communications Manager Administration Guide*, "Cisco Unified IP Phone Configuration" chapter, "Directory Number Configuration" chapter, or "Creating a Cisco Unity Voice Mailbox" section. See the "Telephony Features Available for the Cisco Unified IP Phone" section on page 5-1.
4. Add user information by configuring required fields: • Name (last) • User ID	Adds user information to the global directory for Cisco Unified Communications Manager.	Refer to *Cisco Unified Communications Manager Administration Guide*, "End User Configuration" chapter. See the "Adding Users to Cisco Unified Communications Manager" section on page 5-5.

Table 1-2 Checklist for Configuring the Cisco Unified SIP Phone 3911 in Cisco Unified Communications Manager (continued)

Task	Purpose	For More Information
5. Associate a user with a phone (optional).	Provides users with control over their phone such as forwarding calls or adding speed-dial numbers. **Note** Some phones, such as those in conference rooms, do not have an associated user.	Refer to *Cisco Unified Communications Manager Administration Guide*, "End User Configuration" chapter, "Associating Devices to a User" section.
6. Configure a SIP Phone Dial Plan for the Cisco Unified SIP Phone 3911(optional).	To ensure successful call completion on systems that require digits to be sent one at a time.	Refer to *Cisco Unified Communications Manager Administration Guide*, "SIP Dial Rules Configuration" chapter. See the "Configuring a SIP Phone Dial Plan" section on page 4-9.
7. Configure the system to support the use of DTMF on the Cisco Unified SIP Phone 3911(optional).	Provide users access to voice-messaging systems or to navigate interactive voice response (IVR) applications by using the keypad to generate DTMFs.	Refer to *Cisco Unified Communications Manager Administration Guide*, "Media Termination Point Configurations" chapter and "Cisco Unified IP Phone" chapter. See the "Enabling the Cisco Unified SIP Phone 3911 to Use DTMF" section on page 4-9.

Installing Cisco Unified IP Phones

After you have added the phones to the Cisco Unified Communications Manager 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 that ships in the box with each phone 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. You can find the latest firmware for the Cisco Unified Phone 3911 at http://www.cisco.com/cgi-bin/tablebuild.pl/ip-3900ser.

After the phone is connected to the network, the phone startup process begins and the phone registers with Cisco Unified Communications Manager. 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

Table 1-3 provides an overview and checklist of installation tasks for the Cisco Unified IP Phone. 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 1-3 Checklist for Installing the Cisco Unified SIP Phone 3911

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, 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 3-6.

Table 1-3 Checklist for Installing the Cisco Unified SIP Phone 3911 (continued)

Task	Purpose	For More Information
3. Monitor the phone startup process.	Verifies that phone is configured properly.	See the "Verifying the Phone Startup Process" section on page 3-10.
4. Configure these network settings on the phone by pressing the OK button. Choose **Settings** > **Network Configuration**. To enable DHCP: • Set DHCP Enabled to **Yes** • Enter the Cisco Unified Communications Manager **IP address** for TFTP Server 1 (optional) To disable DHCP: • Set DHCP Enabled to **No** • Enter the static IP address for phone • Enter the subnet mask • Enter the IP address for the default router • Enter the IP addresses for DNS Server 1 and DNS Server 2. • Enter the domain name where the phone resides • Enter the Cisco Unified Communications Manager IP address for TFTP Server	Using DHCP—The IP address is automatically assigned and the Cisco Unified IP Phone is directed to a TFTP Server. **Note** Consult with the network administrator if 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, TFTP server, subnet mask, domain name, and default router locally on the phone.	See the "Configuring Startup Network Settings" section on page 3-11. See the "Configuration Menus on the Cisco Unified IP Phone" section on page 4-3.

Table 1-3 Checklist for Installing the Cisco Unified SIP Phone 3911 (continued)

Task	Purpose	For More Information
5. Make calls with the Cisco Unified IP Phone.	Verifies that the phone and features work correctly.	Refer to the *Cisco Unified SIP Phone 3911 Phone Guide for Cisco Unified Communications Manager.*
6. 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."

CHAPTER 2

Preparing to Install the Cisco Unified IP Phone on Your Network

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

This chapter focuses on the interactions between the Cisco Unified SIP Phone 3911 and Cisco Unified Communications Manager, 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/partner/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:

- Determining the MAC Address for a Cisco Unified IP Phone, page 2-13

Understanding How the Cisco Unified IP Phone Interacts with Cisco Unified Communications Manager

Cisco Unified Communications Manager is an open and industry-standard call processing system. 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 Communications Manager system before sending and receiving calls.

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

- Firmware for phones
- Authentication
- Configuration file via TFTP service
- Phone registration
- Call preservation, so that a media session continues if signaling is lost between the primary Cisco Unified Communications Manager and a phone

For information about configuring Cisco Unified Communications Manager to work with the IP devices described in this chapter, refer to *Cisco Unified Communications Manager Administration Guide, Cisco Unified Communications Manager System Guide,* and *Cisco Unified Communications Manager Security Guide.*

For an overview of security functionality for the Cisco Unified IP Phone, see the "Understanding Security Features for Cisco Unified SIP Phone 3911" section on page 1-9.

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 Communications Manager Administration, go to the following URL and install the latest support patch for your version of Cisco Unified Communications Manager: http://www.cisco.com/kobayashi/sw-center/sw-voice.shtml

Related Topic

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

Phone Behavior During Times of Network Congestion

Anything that degrades network performance can affect Cisco IP Phone voice and video quality, and in some cases, can cause a call to drop. Sources of network degradation can include, but are not limited to, the following activities:

- Administrative tasks, such as an internal port scan or security scan
- Attacks that occur on your network, such as a Denial of Service attack

To reduce or eliminate any adverse effects to the phones, schedule administrative network tasks during a time when the phones are not being used or exclude the phones from testing.

Providing Power to the Cisco Unified IP Phone

The Cisco Unified SIP Phone 3911 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
- Cisco Unified IP Phone Power Injector, page 2-5
- Obtaining Additional Information about Power, page 2-5

Power Guidelines

Table 2-1 provides guidelines for powering the Cisco Unified SIP Phone 3911.

Table 2-1 Guidelines for Powering the Cisco Unified SIP Phone 3911

Power Type	Guidelines
External power—Provided through the CP-PWR-CUBE-3 external power supply.	The Cisco Unified SIP Phone 3911 uses the CP-PWR-CUBE-3 power supply.
External power—Provided through the Cisco Unified IP Phone Power Injector external power supply.	The Cisco Unified IP Phone Power Injector external power supply 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. For more information, see the "Cisco Unified IP Phone Power Injector" section on page 2-5
Inline power—Provided by a switch through the Ethernet cable attached to the phone.	• The Cisco Unified IP Phones support IEEE 802.3af compliant inline power. • The inline power patch panel WS-PWR-PANEL is compatible with the Cisco Unified IP Phones. • 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.

Cisco Unified IP Phone Power Injector

The Cisco Unified IP Phone Power Injector is an external, single-port, midspan power injector for use with Cisco Unified IP Phones. It supports a maximum cable length of 100m between the unpowered switch and the Cisco Unified IP Phone. As a midspan device, it is connected between a switch port and the IP Phone, and may reside in either the switch closet or at the desk.

For more information, see the *Cisco Unified IP Phone Power Injector Installation Guide* at the following location:

http://www.cisco.com/en/US/products/hw/phones/ps379/prod_installation_guide09186a00806b0761.html

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.

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 SIP Phone 3911
- The Cisco Unified 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/hw/phones/ps379/prod_installation_guides_list.html
PoE Solutions	http://www.cisco.com/en/US/netsol/ns340/ns394/ns147/ns412/networking_solutions_package.html
Cisco Catalyst Switches	http://www.cisco.com/en/US/products/hw/switches/tsd_products_support_category_home.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 Communications Manager. In general, any time you make a change in Cisco Unified Communications Manager that requires the phone to be reset, a change is made to the phone's configuration file automatically.

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.

The phone first attempts to access the SEP<MAC>.cnf.xml file. If this file does not exist, then it will look for the XMLDefault.cnf.xml from the TFTP server when the following conditions exist:

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

If auto registration is not enabled and the phone has not been added to the Cisco Unified Communications Manager Database, the phone registration request will be rejected. In this case, the phone will reset and attempt to register repeatedly.

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

For more information on how a SIP phone interacts with the TFTP server, refer to the *Cisco Unified Communications Manager System Guide.*

SIP Dial Rules

For Cisco Unified SIP IP phones, the administrator uses dial rules to configure SIP phone dial plans. These dial plans must be associated with a SIP phone device to enable dial plans to be sent to the configuration file. If the administrator does not configure a SIP phone dial plan, the phone does not display any indication of a dial plan.

For more information on configuring SIP dial rules, refer to the *Cisco Unified Communications Manager Administration Guide*.

Understanding the Phone Startup Process

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

Table 2-3 Cisco Unified IP Phone Startup Process

Step	Description	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 Communications Manager Database, page 2-10. • Resolving Startup Problems, page 7-1.

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

Step	Description	Related Topics
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 7-1.
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.	• Configuration Menus on the Cisco Unified IP Phone, page 4-3. • Resolving Startup Problems, page 7-1.
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.	• Configuration Menus on the Cisco Unified IP Phone, page 4-3. • Resolving Startup Problems, page 7-1.
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 enter information about 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.	• Configuration Menus on the Cisco Unified IP Phone, page 4-3. • Resolving Startup Problems, page 7-1.

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

Step	Description	Related Topics
6. Requesting the Configuration File	The TFTP server has configuration files, which define parameters for connecting to Cisco Unified Communications Manager and other information for the phone.	• Adding Phones to the Cisco Unified Communications Manager Database, page 2-10. • Resolving Startup Problems, page 7-1.
7. Contacting Cisco Unified Communications Manager	The configuration file defines how the Cisco Unified IP Phone communicates with Cisco Unified Communications Manager 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 Communications Manager on the list. If the phone was manually added to the database,Cisco Unified Communications Manager identifies the phone. If the phone was not manually added to the database and auto-registration is enabled in Cisco Unified Communications Manager, the phone attempts to auto-register itself in the Cisco Unified Communications Manager database. **Note** Auto-registration is disabled when security is enabled on Cisco Unified Communications Manager. In this case, the phone must be manually added to the Cisco Unified Communications Managerdatabase.	Resolving Startup Problems, page 7-1.

Adding Phones to the Cisco Unified Communications Manager Database

Before installing the Cisco Unified IP phone, you must choose a method for adding phones to the Cisco Unified Communications Manager database. These sections describe the methods:

- Adding Phones with Auto-Registration, page 2-11
- Adding Phones with Cisco Unified Communications Manager Administration, page 2-11
- Adding Phones with BAT, page 2-12

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

Table 2-4 Methods for Adding Phones to the Cisco Unified Communications Manager

Method	Requires MAC Address?	Notes
Auto-registration	No	Results in automatic assignment of directory numbers
Auto-registration with TAPS	No	Requires auto-registration and the Bulk Administration Tool (BAT); updates the Cisco Unified Communications Manager database with the MAC address and DNs for the device when user calls TAPS from the phone
Using the Cisco Unified Communications Manager Administration	Yes	Requires phones to be added individually
Using BAT	Yes	Allows for simultaneous registration of multiple phones

Adding Phones with Auto-Registration

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 Communications Manager 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.

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 Communications Manager Administration with the correct MAC address.

Auto-registration must be enabled in Cisco Unified Communications Manager Administration (**System > Cisco Unified Communications Manager**) for TAPS to function. To auto-register SIP phones, you must set the Auto Registration Phone Protocol parameter in Cisco Unified Communications Manager Administration to SIP.

Refer to *Cisco Unified Communications Manager Bulk Administration Guide* for detailed instructions about BAT and about TAPS.

Adding Phones with Cisco Unified Communications Manager Administration

You can add phones individually to the Cisco Unified Communications Manager database using Cisco Unified Communications Manager 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 2-13.

After you have collected MAC addresses, in Cisco Unified Communications Manager Administration, choose **Device > Phone** and click **Add New** to begin adding phones to the Cisco Unified Communications Manager database.

For complete instructions and conceptual information about Cisco Unified Communications Manager, refer to *Cisco Unified Communications Manager Administration Guide* and to *Cisco Unified Communications Manager System Guide*.

Related Topics

- Adding Phones with Cisco Unified Communications Manager Administration, page 2-11
- Adding Phones with BAT, page 2-12

Adding Phones with BAT

Cisco Unified Communications Manager Bulk Administration (BAT) is a web-based application that enables you to perform bulk transactions, including registering, multiple phones to the Cisco Unified Communications Manager database.

Before you can use BAT to add phones, you must 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 2-13.

For detailed instructions about using BAT, refer to *Cisco Unified Communications Manager Administration Guide* and to *Cisco Unified Communications Manager Bulk Administration Guide*.

Related Topics

- Adding Phones with Auto-Registration, page 2-11
- Adding Phones with Cisco Unified Communications Manager Administration, page 2-11

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 **OK** button and select **Settings > Network Configuration > Mac Address** to display the MAC Address field.
- Look at the MAC label on the back of the phone.

CHAPTER 3

Setting Up the Cisco Unified IP Phone

This chapter includes this 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 SIP Phone 3911 to successfully operate as a Cisco Unified IP Phone endpoint in your network, your network must meet the following requirements:

- Working Voice over IP (VoIP) Network:
  - VoIP configured on your Cisco routers and gateways
  - Cisco Unified Communications Manager 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

The Cisco Unified IP Phone displays the date and time from Cisco Unified Communications Manager. If the Cisco Unified Communications Manager 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 Communications Manager to handle call processing. Refer to *Cisco Unified Communications Manager Administration Guide* or context-sensitive help in the Cisco Unified Communications Manager application to ensure that Cisco Unified Communications Manager 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 before connecting any Cisco Unified IP Phone to the network. See the "Adding Phones to the Cisco Unified Communications Manager Database" section on page 2-10 for details.

You must use Cisco Unified Communications Manager 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, you can add users to the database and associate them with specific phones. See the "Adding Users to Cisco Unified Communications Manager" section on page 5-5 for details.

Safety

Review the following warnings before installing the Cisco Unified IP Phone. To see translations of these warnings, refer to the *Regulatory Compliance and Safety Information for the Cisco Unified IP Phone* document that accompanied this device.

Warning **Read the installation instructions before you connect the system to its power source.**

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.**

Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.**

Warning **Do not work on the system or connect or disconnect cables during periods of lightning activity.**

Warning **Installation of the equipment must comply with local and national electrical codes**

Warning **The power supply must be placed indoors.**

Warning **To avoid electric shock, do not connect safety extra low voltage (SELV) circuits to telephone network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.**

Caution Inline power circuits provide current over the cable. Use the Cisco provided cable or a minimum 24 AWG communication cable.

The following warnings apply when you use an external power supply.

Caution Only use the proper Cisco approved external power supply. Reference the installation manual provided with the phone.

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15 A U.S. (240 VAC, 10 A international) is used on the phase conductors (all current-carrying conductors).**

Warning **The device is designed to work with TN power systems.**

Warning **The plug-socket combination must be accessible at all times because it serves as the main disconnecting device. #331**

Understanding the Cisco Unified IP Phone Components

The Cisco Unified SIP Phone 3911 includes these components on the phone or as accessories for the phone:

- Network Port, page 3-5
- Handset, page 3-5
- Speakerphone, page 3-5
- Installing the Cisco Unified IP Phone, page 3-6

Network Port

The back of the Cisco Unified SIP Phone 3911 has a port that you use to connect to the network.

Handset

The handset is designed especially for use with a Cisco Unified SIP Phone. To connect a handset to the Cisco Unified SIP Phone, plug the cable into the handset and the Handset port on the back of the phone.

Speakerphone

The Cisco Unified IP Phones has a speaker on/off button. To change from speakerphone to handset, lift the handset.

Headset

Although Cisco Systems performs some internal testing of third-party headsets for use with the Cisco Unified IP Phones, Cisco does not certify or support products from headset or handset vendors. Because of the inherent environmental and hardware inconsistencies in the locations where Cisco Unified IP Phones are deployed, there is not a single "best" solution that is optimal for all environments. Cisco recommends that customers test the headsets that work best in their environment before deploying a large number of units in their network.

In some instances, the mechanics or electronics of various headsets can cause remote parties to hear an echo of their own voice when they speak to Cisco Unified IP Phone users.

Cisco Systems recommends the use of good quality external devices, like headsets that are 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 cell phones and two-way radios, some audio noise may still occur.

The primary reason that support of a headset would be inappropriate for an installation is the potential for an audible hum. This hum can either be heard by the remote party or by both the remote party and the Cisco Unified IP Phone user. Some potential humming or buzzing sounds can be caused by a range of outside sources, for example, electric lights, being near electric motors, large PC monitors. In some cases, a hum experienced by a user may be reduced or eliminated by using the Cisco Unified IP Phone Power Cube 3 (CP-PWR-CUBE-3).

Audio Quality Subjective to User

Beyond the physical, mechanical and technical performance, the audio portion of a headset must sound good to the user and the party on the far end. Sound is subjective and Cisco cannot guarantee the performance of any headsets or handsets, but some of the headsets and handsets on the sites listed below have been reported to perform well on Cisco Unified IP Phones.

Nevertheless, it is ultimately still the customer's responsibility to test this equipment in their own environment to determine suitable performance.

Connecting a Headset

To connect a headset to the Cisco Unified SIP Phone 3911, plug it into the RJ-9 Handset port on the back of the phone. Depending on headset manufacturer's recommendations, an external amplifier may be required. Refer to headset manufacturer's product documentation for details.

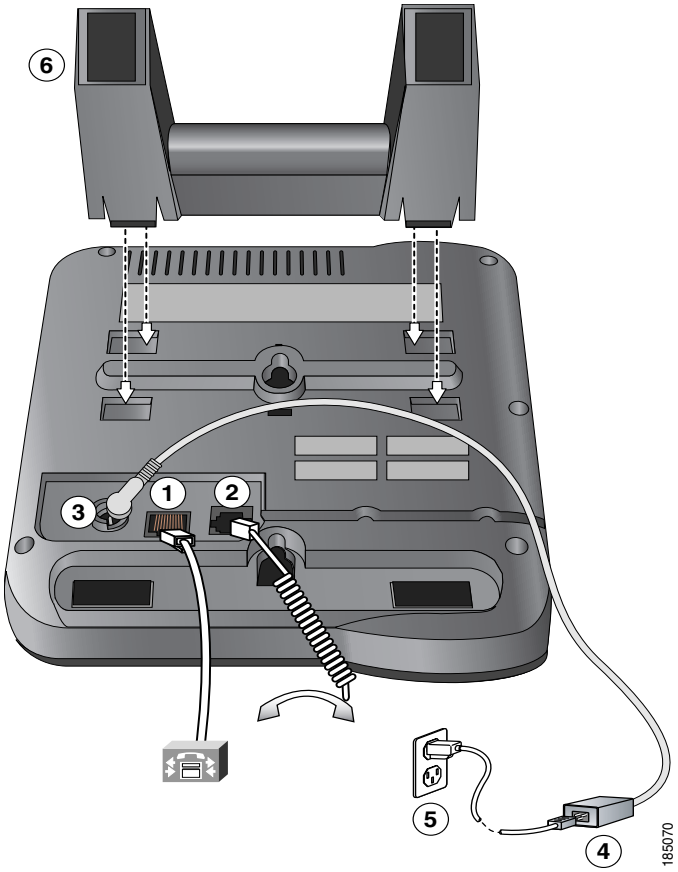
You can use the headset with all of the features on the Cisco Unified IP Phone, including using the Volume button.

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 for a graphical representation of the connections.

Task	Notes	Reference
1. Connect the handset to the Handset port.	—	See the"Handset" section on page 3-5 for guidelines.
2. Connect the power supply to the Cisco DC Adapter port.	Optional.	See the "Providing Power to the Cisco Unified IP Phone" section on page 2-3 for guidelines.
3. Connect a Category 3 or 5 straight-through Ethernet cable from the switch to the network port.	—	See the "Network Port" section on page 3-5 for guidelines.

Figure 3-1 Cisco Unified SIP Phone 3911 Cable Connections



1	Network port (10/100 SW) for connecting to the network.	**4**	Power supply with AC plug. (Optional. Required only if power is not supplied through an Ethernet connection.)
2	RJ-9 Handset port for connecting the handset.	**5**	Power cable with wall socket plug for connecting to power.
3	DC adaptor port (DC48V) for phones not provided with inline power.	**6**	Footstand

Related Topics

- Mounting the Phone to the Wall, page 3-9
- Verifying the Phone Startup Process, page 3-10
- Configuring Startup Network Settings, page 3-11

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. (Wall mount kits must be ordered separately from the phone.) If you attach the Cisco Unified IP Phone to a wall using the standard footstand and not the wall mount kit, you need to supply the following tools and parts:

- Screwdriver
- Screws to secure the Cisco Unified IP phone to the wall

Before You Begin

To ensure that the handset attaches securely to a wall-mounted phone, remove the handset wall hook from the handset rest, rotate the hook 180 degrees, and reinsert the hook. Turning the hook exposes a lip on which the handset catches when the phone is vertical. For an illustrated procedure, refer to *Installing the Wall Mount Kit for the Cisco Unified IP Phone*.

Caution Use care not to damage wires or pipes located inside the wall when securing screws to wall studs.

Procedure

Step 1 Remove the footstand from the phone.

Step 2 Modify the handset rest so that the handset remains on the ear-piece rest when the phone is vertically placed.

a. Remove the handset from the ear-piece rest.

b. Locate the tab (handset wall hook) at the base of the ear-piece rest.

c. Slide this tab out, rotate it 180 degrees (left to right), and reinsert it.

d. Place the handset on the ear-piece rest.

Step 3 Insert two screws into a wall stud, matching them to the two screw holes on the back of the footstand.

The keyholes fit standard phone jack mounts.

Step 4 Hang the phone on the wall.

Verifying the Phone Startup Process

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

1. These buttons lights up:
   - Voice Message Light Indicator
   - Line Light Indicator
   - Conference button
   - MWI button
   - Speaker button
   - Mute button
2. The LCD screen displays the Cisco logo.
3. The LCD screen displays a series of messages that inform you of various activities that the phone performs as it starts up. If the phone upgrades its firmware as part of the startup process, additional messages will inform you about this process.
4. The main LCD screen displays this information:
   - Current date and time
   - Directory number

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 7-1.

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 mask
- Default gateway IP address
- Domain name
- DNS server IP address
- TFTP server IP address

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

CHAPTER 4

Configuring Settings on the Cisco Unified IP Phone

The Cisco Unified IP Phone includes many configurable settings that you may need to modify before the phone is functional for your users. You can access these settings, and change many of them, through the menu on the phone.

This chapter includes the following topics:

Editing Values

When you edit the value of an option setting on a configuration menu or enter a password, follow these guidelines:

- Use the keys on the telephone keypad to enter numbers and letters.
- Press the # key to switch between the following different text entry modes.
  - ABC—uppercase characters
  - abc—lowercase characters
  - 123—numerals

- To enter letters 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 the * (asterisk) key.
- To delete the last character, press the **Cancel** key .
- Once you have completed your entry, press the **OK** button .

Note The Cisco Unified IP Phone provides several methods that 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 7-15.

Related Topics

- Editing Values, page 4-1
- Configuring Network Settings, page 4-3
- SIP Configuration Menu, page 4-8

Unlocking and Locking Options

Administrative configuration options that can be changed from a phone are locked by default to prevent users from making changes that could affect the operation of a phone. You must unlock these options before you can change them.

To unlock or lock options, perform these steps:

Procedure

Step 1 Press the **OK** button.

Step 2 Choose Lock or Unlock.

Step 3 Enter Password. The default password is cisco.

Configuration Menus on the Cisco Unified IP Phone

The Cisco Unified SIP Phone 3911 includes these configuration menus:

- Configuring User Preference, page 4-3—Includes user configurable settings.
- Configuring Network Settings, page 4-3—Includes network settings for the phone.
- SIP Configuration Menu, page 4-8—Includes configurable SIP parameters for the line on the phone.

Configuring User Preference

Once the Cisco Unified IP Phone has registered with Cisco Unified Communications Manager, users can configure their phone settings in the User Preferences menu. For more information, see the *Cisco Unified SIP Phone 3911 Phone Guide for Cisco Unified Communications Manager 6.0 and 5.1*.

Configuring Network Settings

To display or modify current configuration settings, perform these steps:

Procedure

Step 1 Press the **OK** button.

Step 2 Choose Settings.

Step 3 Choose Network Configuration.

Use the navigation key to scroll through the network settings. See Table 4-1 for detail information on each setting. Choose the network setting that you wish to change.

Step 4 If you have not unlocked the phone, the password prompt displays. Enter the password.

Step 5 Enter new network setting. For information about the keys you can use to edit options, see the "Editing Values" section. Press the OK button to accept changes. Press the Cancel button if you do not want to accept the changes.

Step 6 The Reset-Restart prompt display. Press the **Ok** button to restart the phone.

Related Topics

- Editing Values, page 4-1
- Unlocking and Locking Options, page 4-2

Table 4-1 Network Configuration Menu Options

Option	Description	Usage Notes
MAC Address	Unique Media Access Control (MAC) address of the phone.	Display only—cannot configure.
Host Name	Unique host name assigned to the phone.	Display only—cannot configure. Obtained from the DHCP server.
Domain Name	Name of the Domain Name System (DNS) domain in which the phone resides.	When DNS is enabled, the Domain name is assigned by the DHCP server.
IP Address	Unique Internet Protocol (IP) Address for the phone.	When DHCP is enabled, the IP Address is assigned by the DHCP server. When DHCP is disabled, you must configure the IP address. 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.
Subnet Mask	Subnet mask used by the phone.	You must assign a subnet mask if you disabled DHCP.
TFTP Server	Primary Trivial File Transfer Protocol (TFTP) server used by the phone. By default this server is CiscoCM1.	
Dynamic TFTP Server1 Dynamic TFTP Server2	Dynamic TFTP servers that are used by the phone.	Display only—cannot configure.

Table 4-1 Network Configuration Menu Options (continued)

Option	Description	Usage Notes
Default Router 1	Default router used by the phone (Default Router 1).	
DNS Server 1 DNS Server 2	Primary Domain Name System (DNS) server (DNS Server 1) and secondary DNS server (DNS Server 2) 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. If the phone has not received an auxiliary VLAN, this parameter indicates the Administrative VLAN. If neither the auxiliary VLAN nor the Administrative VLAN are configured, this parameter is blank.	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
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, ignored otherwise. Overrides the value specified by the Operational VLAN ID option.	Press the **OK** button to choose whether you wish to enter an auxiliary VLAN.

Table 4-1 Network Configuration Menu Options (continued)

Option	Description	Usage Notes
DHCP Enabled	Indicates whether DHCP is being used by the phone.	Press the **OK** button to choose whether you wish to use DHCP or manually assign IP Address, subnet mask, default router, and DNS server. • Fix(ed) IP – IP Address – Subnet Mask – Default Router 1 – DNS server1 – DNS Server 2 – Domain Name – TFTP Server • DHCP
DHCP Address Released	Releases the IP address assigned by DHCP.	Press the **Yes** button to release the IP address assigned by the DHCP server.
CallManager 1 CallManager 2 CallManager 3 CallManager 4 CallManager 5	Cisco Unified Communications Manager servers that are available for processing calls from this phone, in prioritized order.	For more information, see the "Cisco Unified Communications Manager Options" section on page 4-7.
Erase	Erases current configurations. Changes Network Configuration settings to their default values.	

Cisco Unified Communications Manager Options

The CallManager 1 through CallManager 5 options on the Network configuration menu show the host names or IP addresses, in prioritized order, of the Cisco Unified Communications Manager servers that the phone can register to. These options show Cisco Unified Communications Manager servers that are available for processing calls from the phone, in prioritized order.

For an available server, an option 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 option may also include using CallManager 4 and CallManager 5 as one of these designations:

- SRST—Indicates Survivable Remote Site Telephony (SRST) designation, which indicates 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.

Note After a failover to a SRST router, the phone will monitor the links to the Cisco Unified Communications Manager servers that the phone can register to. When a server has been available for two minutes, by default, the phone will fall back from the router to that server. You can change this default time by specifying another value for the Connection Monitor Duration parameter in Cisco Unified Communications Manager Administration. For more information, refer to *Cisco Unified Communications Manager Administration Guide*.

- TFTP designation—Indicates that the phone was unable to register with a Cisco Unified Communications Manager listed in its configuration file and it registered with the TFTP server instead.

Related Topics

- Editing Values, page 4-1
- Unlocking and Locking Options, page 4-2

SIP Configuration Menu

The SIP Configuration menu displays information that relates to the configurable parameters for the line and SIP parameters on the phone.

Note These are read-only parameters and cannot be edited on the phone.

Table 4-2 SIP Configuration Menu Options

Parameters	Description
Number	Displays the directory number that is assigned to the line when the phone registered.
Name	Displays the user name that is assigned to the line when the phone registered.
Authentication Name	The name that the user can use for authentication when registration is challenged by the call control server during initialization.
Password	The corresponding password that is used to authenticate the user.

Additional Configurations for the Cisco Unified SIP Phone 3911

Depending on your network configuration and topology, you may need configure the Cisco Unified SIP Phone 3911 on the Cisco Unified Communications Manager to include the following:

- Configuring a SIP Phone Dial Plan, page 4-9
- Enabling the Cisco Unified SIP Phone 3911 to Use DTMF, page 4-9

Configuring a SIP Phone Dial Plan

Key Press Markup Language (KPML) allows for the digits to be sent to Cisco Unified Communications Manager digit by digit. Cisco Unified Communications Manager defaults to the use (KPML) when SIP dial rules are not configured. SIP Dial Rules allow for a pattern of digits to be collected locally on the phone prior to sending to Cisco Unified Communications Manager. Cisco Unified SIP Phone 3911 does not support KPML. To ensure successful call completion, you must use the 7940_7960_OTHER dial rules pattern to configure a SIP phone dial plan and to associate the plan with the Cisco Unified SIP Phone 3911.

Enabling the Cisco Unified SIP Phone 3911 to Use DTMF

To access voice-messaging systems or to navigate interactive voice response (IVR) applications from Cisco Unified SIP Phone 3911, you must have one of the following configurations on your system:

- Verify that you have a transcoding device that supports RFC 2833 on your system and that the trunk that is going to the transcoder is configured for MTP by using Cisco Unified Communications Manager Administration.
- On Cisco Unified Communications Manager Administration, check the Require DTMF Reception checkbox for each registered Cisco Unified SIP Phone 3911. Cisco Unified Communications Manager will verify transcoder support for RFC 2833 and allocate its own MTP resource as necessary.

Tip You can monitor MTP resources by using the alert window in RTMT.

Tip Use Cisco Unified Communications Manager Bulk Administration (BAT) when you have a large number of phones to configure.

CHAPTER 5

Configuring Features and Users

After you install Cisco Unified IP Phones in your network, configure their network settings, and add them to Cisco Unified Communications Manager, you must then use the Cisco Unified Communications Manager Administration application to configure some telephony features, and assign users.

This chapter provides an overview of these configuration and set up procedures. Cisco Unified Communications Manager documentation provides detailed instructions for these procedures.

You configure most telephony features on the phone itself. For additional information, refer to *Cisco Unified SIP Phone 3911 User Guide*.

This chapter includes following topics:

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.

For information about using most of these features on the phone, refer to *Cisco Unified SIP Phone 3911 Phone Guide for Cisco Unified Communications Manager*.

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

Feature	Description	Configuration Reference
Anonymous Call Block	Allows users to reject calls from anonymous callers.	For more information, refer to *Cisco Unified Communications Manager Administration Guide*, "SIP Profile Configuration" chapter.
Call Forward All	Forwards all calls sent to the phone to the number specified.	Requires no configuration. Users forward their calls by entering the target number.
Call Hold Ringback	When you complete a call while another call is on hold, causes the phone to ring as a notification that a call is on hold.	For more information, refer to *Cisco Unified Communications Manager Administration Guide*, "SIP Profile Configuration" chapter.
Call Waiting	Indicates (and allows a user to answer) an incoming call that is received while the user is on another call. Call waiting also displays incoming call information on the phone screen.	Requires no configuration.
Caller ID Blocking	Allows users to block their phone numbers from phones that have caller identification enabled.	For more information, refer to *Cisco Unified Communications Manager Administration Guide*, "SIP Profile Configuration" chapter.

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

Feature	Description	Configuration Reference
Conference	Allows a user to talk simultaneously with up to two other parties (for a total of three participants) by calling each participant individually.	Requires no configuration. Conferencing is initiated by the user on the Cisco Unified SIP Phone 3911 itself and does not use Cisco Unified Communications Manager resources, so the user must remain in the conference for the two other parties to stay connected and interact with one another.
Message Waiting Indicator	Refers to the light (or "lamp") on the phone that blinks or glows to indicate an incoming call or new voice message.	For more information refer to: • *Cisco Unified Communications Manager Administration Guide,* "Message Waiting Configuration" chapter. • *Cisco Unified Communications Manager System Guide,* "Voice Mail Connectivity to Cisco Unified Communications Manager" chapter.
Personal Directory	Allows a user to store names and phone numbers in a personal directory.	For more information on storing names and phone numbers in a personal directory, refer to *Cisco Unified SIP Phone 3911 Phone Guide for Cisco Unified Communications Manager*.
Redial	Allows users to call the most recently dialed phone number by pressing a button.	Requires no configuration.

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

Feature	Description	Configuration Reference
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 refer to *Cisco Unified Communications Manager System Guide,* "Cisco Unified IP Phones" chapter. **Note** For the Cisco Unified SIP Phone 3911, this feature has limited support. Incoming calls will ring on both phones The call then goes to whichever phone picks up the call, but the phone cannot perform any of the other functions that are associated with the shared-line feature.
Speed Dial	Allows a user to access a menu with a list of up to 4 speed dialed numbers.	For more information, refer to *Cisco Unified SIP Phone 3911 Phone Guide for Cisco Unified Communications Manager*.
Stutter Msg Waiting	Indicates whether a user hears a stutter tone when the phone goes offhook and a message is waiting for the user.	For more information, refer to *Cisco Unified Communications Manager Administration Guide*, "SIP Profile Configuration" chapter.
Transfer	Allows users to redirect connected calls from their phones to another number.	Requires no configuration.

Adding Users to Cisco Unified Communications Manager

Adding users to Cisco Unified Communications Manager allows you to display and maintain information about users. You can add users to Cisco Unified Communications Manager using either of these methods:

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

  Refer to *Cisco Unified Communications Manager Administration Guide* for more information about adding users. Refer to *Cisco Unified Communications Manager System Guide* for details about user information.

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

  Refer to *Cisco Unified Communications Manager Bulk Administration Guide* for details.

CHAPTER 6

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

This chapter describes how to access and use the following screens on the Cisco Unified IP Phone:

- Network Statistics Screen, page 6-1—Displays information about the network performance of the phone.
- Firmware Versions Screen, page 6-2—displays information about the firmware that is running on the phone.

You access these screens from the Status menu on the phone.

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

For more information about troubleshooting, see Chapter 7, "Troubleshooting and Maintenance."

Network Statistics Screen

The Network Statistics screen displays information about the phone and network performance. Table 6-1 explains components of text messages that might appear in this screen.

To display the Network Statistics screen, follow these steps:

Procedure

Step 1 Press the **OK** button.

Step 2 Select **Status**.

Step 3 Select **Network Statistics**.

To exit the Network Statistics screen, press the **cancel** key.

Table 6-1 Network Statistics Message Components

Message Component	Description
Rx Frames	Number of packets received by the phone
Tx Frames	Number of packets transmitted by the phone

Firmware Versions Screen

The Firmware Versions screen displays information about the firmware that is running on the phone. Table 6-2 explains the information that is displayed on this screen.

To display the Firmware Versions screen, follow these steps:

Procedure

Step 1 Press the Navigator Key.

Step 2 Press the **Cancel** button.

Step 3 Select **Status**.

Step 4 Select **Firmware Versions**.

To exit the Firmware Versions screen, press the **Exit** softkey.

Table 6-2 Firmware Versions Information

Message Component	Description
Load File	Identifies the Load file that is running on the phone.
App Load ID	Identifies the application file that is running on the phone.
Boot Load ID	Identifies the factory-installed load running on the phone.
DSP Load ID	Identifies the Digital Signal Processor (DSP) software version used.

CHAPTER 7

Troubleshooting and Maintenance

This chapter provides information that can assist you in troubleshooting problems with your Cisco Unified IP Phone or in your IP telephony network.

If you need additional troubleshooting assistance, you can contact the Cisco TAC. The phone generates detailed logs that can assist the Cisco TAC with troubleshooting and resolving problems.

This chapter includes these topics:

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 3-10. 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

When you connect a Cisco Unified IP Phone into the network port, the phone should go through its normal startup process 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 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:
   - 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.

If after attempting these solutions, the LCD screen on the Cisco Unified IP Phone does not display any characters after at least five minutes, perform a factory reset of the phone (see the "Where to Go for More Troubleshooting Information" section on page 7-16). If the phone still does not display characters, 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 displays error messages 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 7-3
- Registering the Phone with Cisco Unified Communications Manager, page 7-4
- Checking Network Connectivity, page 7-4
- Verifying TFTP Server Settings, page 7-4
- Verifying IP Addressing and Routing, page 7-5
- Verifying DNS Settings, page 7-5
- Verifying Cisco Unified Communications Manager Settings, page 7-5
- Cisco Unified Communications Manager and TFTP Services Are Not Running, page 7-6
- Creating a New Configuration File, page 7-6

In addition, problems with security may prevent the phone from starting up properly. See the "General Troubleshooting Tips for the Cisco Unified IP Phone" section on page 7-12 for more information.

Identifying Error Messages

As the Cisco Unified SIP Phone 3911 cycles through the startup process, you can access status messages that might provide you with information about the cause of a problem.

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. Review the information and procedures in the "Adding Phones to the Cisco Unified Communications Manager Database" section on page 2-10 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 2-13.

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 7-6 for assistance.

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

The Cisco Unified IP Phone uses the TFTP Server 1 setting to identify the primary TFTP server used by the phone. You can determine this setting by pressing the **OK** button and choosing **Settings > Network Configuration > TFTP Server**.

If you have assigned a static IP address to the phone, you must manually enter a setting for the TFTP Server 1 option. You can also enable the phone to use a dynamic TFTP server.

For more information on configuring network settings, see the "Configuring Network Settings" section on page 4-3.

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 **OK** button and choose **Settings > Network Configuration > DHCP Enabled.**

- DHCP Enabled—Verify that DHCP Enabled is set to **yes**. If it is not, check your IP routing and VLAN configuration. Refer to *Troubleshooting Switch Port Problems*, available at this URL: http://www.cisco.com/warp/customer/473/53.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 "Configuring Network Settings" section on page 4-3 for instructions.

If you are using DHCP, check the IP addresses distributed by your DHCP server. Refer to *Understanding and Troubleshooting DHCP in Catalyst Switch or Enterprise Networks*, available at this URL: http://www.cisco.com/warp/customer/473/100.html#41

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. 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.

Verifying Cisco Unified Communications Manager Settings

On the Cisco Unified IP Phone, press the **OK** button and choose **Settings > Network Configuration > CallManager 1 - 6**. The Cisco Unified IP Phone attempts to open a TCP connection to all the Cisco Unified Communications Manager servers that are part of the assigned Cisco Unified Communications Manager group. If none of these options contain IP addresses or show Active or Standby, the phone is not properly registered with Cisco Unified Communications Manager. See the "Registering the Phone with Cisco Unified Communications Manager" section on page 7-4 for tips on resolving this problem.

Cisco Unified Communications Manager and TFTP Services Are Not Running

If the Cisco Unified Communications Manager or TFTP services are not running, phones may not be able to start up properly. In this case, it is likely that you are experiencing a system-wide failure and that other phones and devices are unable to start up properly.

If the Cisco Unified Communications Manager 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 **Serviceability** from the Navigation drop-down list.

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

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

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

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:

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 Communications Manager Database" section on page 2-10 for details.

Step 4 Power cycle the phone:

- If the phone receives power from an external power source, unplug the Ethernet cable from the Network port on the phone, then unplug the power supply from the DC adaptor port on the phone. Next, reconnect the power supply and then reconnect the Ethernet cables.

Caution Always unplug the upstream Ethernet cable from the phone before unplugging the power supply. Unplugging the power supply before unplugging the upstream Ethernet cable could result in a service interruption on the network.

- If the phone receives inline power, unplug the cable from the Network port on the phone and then plug it back in.

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 ManagerAdministration 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.

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 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.

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 Physical Connection, page 7-9
- Identifying Intermittent Network Outages, page 7-9
- Verifying DHCP Settings, page 7-9
- Checking Static IP Address Settings, page 7-10
- Verifying Voice VLAN Configuration, page 7-10
- Verifying that the Phones Have Not Been Intentionally Reset, page 7-10
- Eliminating DNS or Other Connectivity Errors, page 7-11

Verifying Physical Connection

Verify that the Ethernet connection to which the Cisco Unified IP Phone is connected is up. For example, check if the particular port or switch to which the phone is connected is down.

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 "Configuring Network Settings" section on page 4-3 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.

   Cisco Unified IP Phones send messages with request type 151 to renew their DHCP address leases. If the DHCP server expects messages with request type 150, the lease will be denied, forcing the phone to restart and request a new IP address from the DHCP server.

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 "Configuring Network Settings" section on page 4-3 for more information.

Verifying 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 same switch as 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.

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 your phone received a command from Cisco Unified Communications Managerr to reset by pressing the **Settings** button on the phone and choosing **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 Reset the phone to factory defaults. See the "Resolving Startup Problems" section on page 7-1 for details.

Step 2 Modify DHCP and IP settings:

a. Disable DHCP. See the "Configuring Network Settings" section on page 4-3 for instructions.

b. Assign static IP values to the phone. See the "Configuring Network Settings" section on page 4-3 for instructions. Use the same default router setting used for other functioning Cisco Unified IP Phones.

c. Assign a TFTP server. See the "Configuring Network Settings" section on page 4-3 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 2-13.

Step 6 Power cycle the phone:

- If the phone receives power from an external power source, unplug the Ethernet cable from the Network port on the phone, then unplug the power supply from the DC adaptor port on the phone. Next, reconnect the power supply and then reconnect the Ethernet cable.

Caution Always unplug the upstream Ethernet cable from the phone before unplugging the power supply. Unplugging the power supply before unplugging the upstream Ethernet cable could result in a service interruption on the network.

- If the phone receives inline power, unplug the cable from the Network port on the phone and then plug it back in.

General Troubleshooting Tips for the Cisco Unified IP Phone

Table 7-1 provides general troubleshooting information for the Cisco Unified IP Phone.

Table 7-1 Cisco Unified IP Phone Troubleshooting

Summary	Explanation
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 re-register.	Prolonged broadcast storms (lasting several minutes) on the voice VLAN cause the IP phones to re-register with another Cisco Unified Communications Manager server.

Table 7-1 Cisco Unified IP Phone Troubleshooting (continued)

Summary	Explanation
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 configuration options are locked to prevent users from making changes that could impact their network connectivity. You must unlock the network configuration options before you can configure them. See the "Unlocking and Locking Options" section on page 4-2 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.

Table 7-1 Cisco Unified IP Phone Troubleshooting (continued)

Summary	Explanation
Codec mismatch between the phone and another device.	The RxType and the TxType that is being used for a conversation between this IP phone and the other device 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.
Sound sample mismatch between the phone and another device.	The size of the voice packets that are being used in a conversation between this IP phone and the other device should match.
Gaps in voice calls.	Can be caused by a problem with jitter on the network or periodic high rates of network activity.
Checking signaling.	To check that signaling is working properly between the phone and Cisco Unified Communications Manager, press the **Speaker** button on the phone to answer a call. If you can answer a call and if you hear a dial tone, signaling is working properly.
Checking the handset cradle clip.	Cisco Unified IP Phones are designed with a reversible handset clip in the cradle. This clip is used with the plastic tab protruding out when the phone is in a vertical (wall-mounted) position. The position of the tab can interfere with the handset as it is placed in the cradle. If the phone remains in the on-hook position you may experience continued ringing when you try to answer a call or a lack of dial tone when you try to place a call. To resolve this problem, you may need to reverse the clip. If the handset cradle clip is in the wall-mounted position and your phone is placed on a desktop, slide the clip upward to remove it. Rotate the clip 180 degrees and slide it back in so that the tab is hidden. If the hook switch remains in the down position, tapping on the phone should free up the switch. You can also try pushing and suddenly releasing the off-hook button after the handset has been picked up.

Table 7-1 Cisco Unified IP Phone Troubleshooting (continued)

Summary	Explanation
Checking the hook switch contacts.	The hook switch contacts on the phone use a wiping action to self-clean the contacts. If your phone is not used regularly, dust and other airborne contaminants may degrade the contact performance and cause problems with operation. If you have periods of limited phone usage, you can clean the contacts by quickly pressing and releasing the hook switch a dozen times.
Checking the LAN cable.	Make sure that the LAN cable connected to the phone is positioned properly. The LAN cable should pass out of the side of the phone between the base and the footstand. If you are using a cable (such as Cat-5E or Cat-6) with a larger diameter than the cable that was packaged with your phone, the cable may cause the phone to tilt forward and force it off-hook. Use a smaller LAN cable to eliminate this problem.
Loopback condition.	A loopback condition can occur when the following conditions are met: • The SW Port Configuration option in the Network Configuration menu on the phone is set to **10H** (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.

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, page 7-16

- Where to Go for More Troubleshooting Information, page 7-16

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.

A basic reset resets any user and network configuration changes that you have made but that the phone has not written to its Flash memory to previously-saved settings, then restarts the phone.

To perform a basic reset, press the OK button follow by **#**.

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_series_home.html

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

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

APPENDIX A

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

To successfully use some of the features on the Cisco Unified IP Phone (including speed dial 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.

How Users Get Copies of Cisco Unified IP Phone Manuals

You should provide end users with access to user documentation for the Cisco Unified IP Phones. The *Cisco Unified SIP Phone 3911 Phone Guide* includes detailed user instructions for key phone features.

There are several Cisco Unified IP Phone models available, so to assist users in finding the appropriate documentation on the Cisco website, Cisco recommends that you provide links to the current documentation. If you do not want to or cannot send users to the Cisco website, Cisco suggests that you download the PDF files and provide them to end users on your website.

Documentation is also available on the CD-ROM titled *Cisco Unified Communications Manager Design, Installation, and Operation Guides,* which is distributed with Cisco Unified Communications Manager releases.

For a list of available documentation for Cisco Unified IP Phones, go to this URL:

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

For a list of available documentation for Cisco Unified Communications Manager, go to this URL:

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

For more information about viewing or ordering documentation, see the "Obtaining Documentation, Obtaining Support, and Security Guidelines" section on page xiv.

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 password for accessing the voice messaging system.

  Make sure that you have configured a default voice messaging system password 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.

APPENDIX **B**

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 Communications Manager Locale Installer

If you are using Cisco Unified IP Phones in a locale other than English, you must install the locale-specific version of the Cisco Unified Communications Manager Locale Installer on every Cisco Unified Communications Manager 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 Communications Manager 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 *Cisco Unified Communications Operating System Administration Guide.*

Note All languages may not be immediately available, so continue to check the website for updates.

APPENDIX C

Technical Specifications

The following sections describe the technical specifications for the Cisco Unified SIP Phone 3911.

Physical and Operating Environment Specifications

Table C-1 shows the physical and operating environment specifications for the Cisco Unified SIP Phone 3911.

Table C-1 Physical and Operating Specifications

Specification	Value or Range
Operating temperature	23° to 104°F (-5° to 40°C)
Operating relative humidity	90% (+/- 5 %)
Storage temperature	Up to 140°F (60°C)
Height	200 mm
Width	180 mm
Depth	45 mm
Weight	505 g

Table C-1 Physical and Operating Specifications (continued)

Specification	Value or Range
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	• One (2) pair of Category 3 for 10-Mbps cables or One (2) pair of Category 5 for 100-Mbps cables • RJ-9 jack (4-conductor) for handset and headset connection. • RJ-45 jack for the LAN 10/100BaseT connection. • 48-volt power connector.
Distance Requirements	As supported by the Ethernet Specification, it is assumed that most Cisco Unified IP Phones should be within 330 feet (100m) of a phone closet.

Network Port Pinouts

Although both the network and access ports are used for network connectivity, they serve different purposes and have different port pinouts.

Table C-1 describes the network port connector pinouts.

Table C-1 Network Port Connector Pinouts

Pin Number	Function
1	TD+
2	TD–
3	RD+
4	Not used
5	Not used
6	RD–
7	Not used
8	Not used

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