

Cisco IP Phone Administration Guide for Cisco CallManager 3.2

Cisco IP Phones 7960, 7940, and 7910

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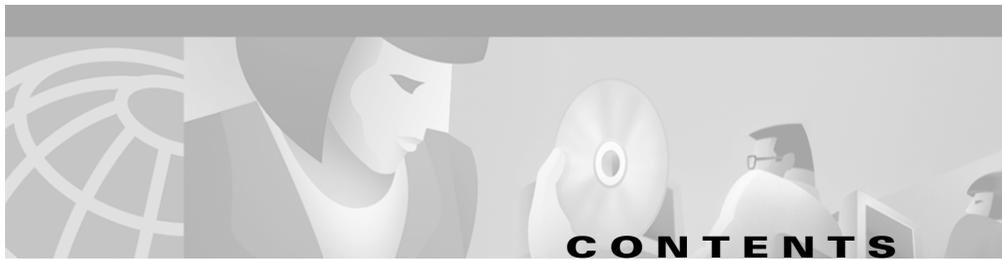
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Cisco IP Phone Administration Guide for Cisco CallManager 3.2, Cisco IP Phones 7960, 7940, and 7910

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About This Guide ix

| | |
|--------------------------------|------|
| Overview | ix |
| Audience | ix |
| Objectives | x |
| Organization | x |
| Related Documentation | xi |
| Obtaining Documentation | xii |
| World Wide Web | xii |
| Documentation CD-ROM | xii |
| Ordering Documentation | xiii |
| Documentation Feedback | xiii |
| Obtaining Technical Assistance | xiv |
| Cisco.com | xiv |
| Technical Assistance Center | xiv |
| Cisco TAC Web Site | xv |
| Cisco TAC Escalation Center | xvi |
| Document Conventions | xvi |

CHAPTER 1

An Overview of the Cisco IP Phone 1-1

| | |
|---|-----|
| Understanding the Cisco IP Phone Models 7960 and 7940 | 1-2 |
| Understanding the Cisco IP Phone 7910 | 1-5 |
| What Networking Protocols Are Used? | 1-7 |

- What Features are Supported on the Cisco IP Phone? **1-9**
 - Feature Overview **1-10**
 - Configuring Telephony Features Using Cisco CallManager Administration **1-10**
 - Configuring Network Features Using the IP Phone **1-11**
 - Providing Users with Feature Information **1-11**
- Understanding the Requirements for Installing and Configuring the Cisco IP Phone **1-12**

CHAPTER 2

Preparing to Install the Cisco IP Phone on Your Network 2-1

- Understanding Interactions with Other Cisco IP Telephony Products **2-1**
 - Understanding How the Cisco IP Phone Interacts with Cisco CallManager **2-2**
 - Understanding How the Cisco IP Phone Interacts with the Cisco Catalyst Family of Switches **2-2**
- Understanding the Phone Startup Process **2-3**
 - Obtaining Power from the Switch **2-4**
 - Loading the Stored Phone Image **2-4**
 - Configuring VLAN **2-4**
 - Obtaining an IP Address **2-4**
 - Accessing TFTP Server **2-5**
 - Requesting the Configuration File **2-5**
 - Contacting Cisco CallManager **2-5**
- Guidelines for Configuring Ports on Cisco IP Phones **2-6**
 - Connecting to the Network **2-6**
 - Using the Network Port **2-6**
 - Using the Access Port **2-7**
 - Providing Power to the Cisco IP Phone **2-7**
 - Power Source Design **2-7**
 - Redundancy Feature **2-8**

| | |
|--|------|
| Configuring the Handset, Headset, and Speakerphone | 2-8 |
| Connecting a Handset to a Cisco IP Phone | 2-9 |
| Connecting a Headset to a Cisco IP Phone | 2-9 |
| Disabling the Speakerphone Feature | 2-10 |
| Adding Phones to the Cisco CallManager Database | 2-10 |
| Using Auto-Registration | 2-11 |
| Adding Phones Manually | 2-12 |
| Adding Phones Manually Using DHCP | 2-12 |
| Assigning Static IP Addresses | 2-13 |
| Using the Bulk Administration Tool | 2-15 |
| Configuring the Cisco IP Phone 7960 to Support the 7914 Expansion Module | 2-15 |

CHAPTER 3**Installing the Cisco IP Phone 3-1**

| | |
|---|------|
| Before You Begin | 3-1 |
| Network Requirements | 3-2 |
| Cisco CallManager Configuration | 3-2 |
| Safety | 3-3 |
| Connecting the Cisco IP Phone to the Network | 3-4 |
| Adjusting Placement of the Cisco IP Phone | 3-7 |
| Adjusting Cisco IP Phone Placement on the Desktop | 3-7 |
| Mounting the Phone to the Wall | 3-7 |
| Verifying the Phone Startup Process | 3-9 |
| Configuring Startup Network Settings | 3-10 |

CHAPTER 4**Adding the Cisco IP Phone 7914 Expansion Module 4-1**

| | |
|--------------------------------------|-----|
| Installing the 7914 Expansion Module | 4-2 |
| Before You Begin | 4-2 |
| Package List | 4-2 |
| Footstand Kits | 4-2 |

- Additional Equipment 4-3
- Safety Notices 4-3
- Connecting the 7914 Expansion Module 4-4
 - Removing the Footstand from the Cisco IP Phone 7960 4-5
 - Connecting the Support Bar to the Cisco IP Phone 7960 4-6
 - Connecting the 7914 Expansion Module to the Support Bar 4-7
 - Connecting the RS 232 Cable 4-9
 - Connecting the Power Supply 4-11
 - Connecting the Footstand 4-12
- Start Up Sequence 4-14

CHAPTER 5

Configuring Network Settings on the Cisco IP Phone 5-1

- Accessing the Network Configuration Settings 5-2
- Verifying Network Settings 5-3
- Modifying DHCP Settings 5-9
 - Enabling DHCP 5-10
 - Disabling DHCP 5-11
 - Releasing a DHCP Address 5-12
- Configuring IP Settings 5-14
 - Assigning an IP Address 5-14
 - Assigning Default Router 5-15
 - Assigning Subnet Mask 5-17
 - Assigning Domain Name 5-18
 - Assigning DNS Servers 5-19
- Configuring VLAN Settings 5-20
- Configuring TFTP Options 5-21
 - Assigning a TFTP Sever 5-21
 - Using an Alternate TFTP Server 5-23
 - Assigning a Backup TFTP Server 5-24

- Configuring Ports 5-25
 - Configuring the SW Port 5-26
 - Configuring the PC Port 5-27

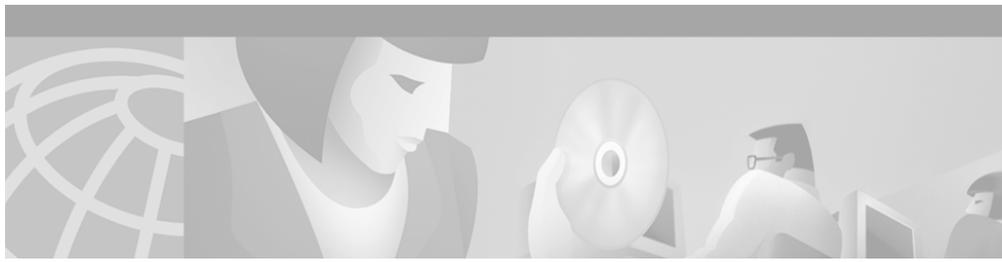
CHAPTER 6**Configuring Cisco IP Phones, Users, and Features in Cisco CallManager 6-1**

- Configuring Cisco IP Phones in Cisco CallManager 6-2
- Adding Users to Cisco CallManager 6-5
- Modifying Phone Button Templates 6-5
 - Possible Phone Button Template Configurations 6-6
 - Updating Button Labels 6-7
- Configuring Corporate Directories 6-8
- Setting Up User Services 6-8
- Providing Information to End Users 6-9

CHAPTER 7**Troubleshooting the Cisco IP Phone 6-1**

- Obtaining Status, Model, and Version Information 6-1
 - Displaying Statistics for Current Call 6-2
 - Viewing Status Messages 6-3
 - Displaying Network Statistics 6-8
 - Verifying Model and Serial Number 6-10
 - Verifying Firmware Version 6-11
- Resetting the Cisco IP Phone 6-12
- Erasing Local Configuration 6-13
- Updating Firmware Version 6-14
- Resolving Startup Problems 6-15
 - Symptom: Cisco IP Phone Does Not Start Up and LCD Screen Does Not Display 6-16

- Symptom: Cisco IP Phone Not Registering with Cisco CallManager 6-17
 - Identifying Error Messages 6-17
 - Registering the Phone with Cisco CallManager 6-18
 - Checking Network Connectivity 6-18
 - Verifying TFTP Server Settings 6-18
 - Verifying IP Addressing and Routing 6-19
 - Verifying DNS Settings 6-19
 - Verifying Cisco CallManager Settings 6-20
 - Cisco CallManager and TFTP Services Are Not Running 6-20
 - Creating a New Configuration File 6-21
- Symptom: Cisco IP Phone Resetting 6-21
 - Verifying Physical Connection 6-22
 - Identifying Intermittent Network Outages 6-22
 - Verifying DHCP Settings 6-23
 - Checking Static IP Address Settings 6-23
 - Verifying Voice VLAN Configuration 6-23
 - Verifying that the Phones Have Not Been Intentionally Reset 6-23
 - Eliminating DNS or Other Connectivity Errors 6-24
- Resolving Known Issues 6-25
- Technical Specifications A-1**
 - Physical and Operating Environment Specifications A-1
 - Cable Specifications A-2
 - Network and Access Port Pinouts A-2



About This Guide

Overview

Cisco IP Phone Administration Guide for Cisco CallManager 3.2, Cisco IP Phones 7960/7940/7910 provides the information you need to understand, install, configure, and manage a Cisco IP Phone on your network.

Audience

Network engineers, system administrators, or telecom engineers should review this guide to learn the steps required to properly set up the Cisco IP Phone 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 IP Phone and Cisco CallManager, these tasks require familiarity with Cisco CallManager.

Objectives

This guide provides the required steps to get the Cisco IP Phone up and running on a Voice-over-IP (VoIP) network. Because of the complexity of an IP telephony network, this guide does not provide complete and detailed information for procedures that you need to perform on the Cisco CallManager application or other network devices.

Organization

[Table 1](#) provides an overview of the organization of this guide.

Table 1 *Cisco IP Phone Administration Guide Organization*

| Chapter | Description |
|--|--|
| Chapter 1, “An Overview of the Cisco IP Phone” | Provides a conceptual overview and description of the Cisco IP Phone. |
| Chapter 2, “Preparing to Install the Cisco 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, “Installing the Cisco IP Phone” | Describes how to properly and safely install and configure the Cisco IP Phone on your network. |
| Chapter 4, “Installing the 7914 Expansion Module” | Describes how to install and connect one or two Cisco IP Phone 7914 Expansion Modules on the Cisco IP Phone 7960. |
| Chapter 5, “Configuring Network Settings on the Cisco IP Phone” | Describes how to configure network settings, verify status, and make global changes to the Cisco IP Phone. |
| Chapter 6, “Configuring Cisco IP Phones, Users, and Features in Cisco CallManager” | Provides an overview of procedures for adding users to the network, configuring corporate directories, and setting up web information services. |
| Chapter 7, “Troubleshooting the Cisco IP Phone” | Provides tips for troubleshooting the Cisco IP Phones and the Expansion Module. |

Table 1 Cisco IP Phone Administration Guide Organization (continued)

| Chapter | Description |
|--|--|
| Appendix A, “Technical Specifications” | Provides a reference of the detailed technical specifications of the Cisco IP Phone. |
| Index | Provides reference information. |

Related Documentation

For more information about Cisco IP Phones or Cisco CallManager, refer to these publications, which are available at the following location:

<http://www.cisco.com/univercd/cc/td/doc/product/voice/index.htm>

Cisco IP Phone Models 7960, 7940, and 7910

- *Find Your Phone Guide on the Web*
- *At a Glance Cisco IP Phone Models 7960 and 7940*
- *Cisco IP Phone Models 7960 and 7940 User Guide*
- *Quick Reference Cisco IP Phone 7960/7940*
- *Release Notes for the IP Phone 7960/7940/7910*
- *Getting Started with the Cisco IP Phone 7910*
- *Cisco IP Phone 7910 Quick Reference Card*

Cisco CallManager Administration

- *Cisco CallManager Administration Guide*
- *Cisco CallManager System Guide*
- *Cisco CallManager Serviceability Administration Guide*
- *Cisco CallManager Serviceability System Guide*
- *Bulk Administration Tool User Guide*

Cisco IP Phones Services and Features

- *Personal Directory Configuration Guide*

Cisco IP Phone 7914 Expansion Module

- *Cisco IP Phone 7914 Expansion Module Quick Start Guide*

Cisco Customer Response Applications 2.2

- *Cisco CallManager Extended Services Administrator's Guide*

You can find these publications on the Web from links at the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/voice/index.htm>

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

<http://www.cisco.com>

Translated documentation is available at the following URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

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- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>
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Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

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- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

<http://www.cisco.com/register/>

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.

Document Conventions

This document uses the following conventions:

| Convention | Description |
|-----------------------------|---|
| boldface font | Commands and keywords are in boldface . |
| <i>italic font</i> | Arguments for which you supply values are in <i>italics</i> . |
| [] | 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 <code>screen font</code> . |
| boldface screen font | Information you must enter is in boldface screen font . |
| <i>italic screen font</i> | Arguments for which you supply values are in <i>italic screen font</i> . |

| Convention | Description |
|------------|--|
| ^ | The symbol ^ represents the key labeled Control—for example, the key combination ^D in a screen display means hold down the Control key while you press the D key. |
| < > | Nonprinting characters, such as passwords are in angle brackets. |

**Note**

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

**Caution**

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

Warnings use the following conventions:

**Warning**

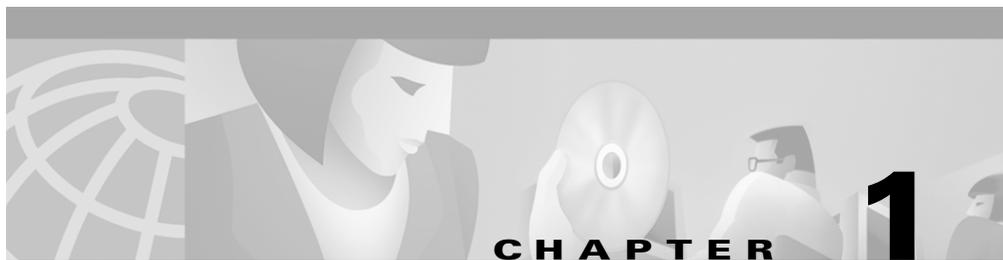
This warning symbol means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

Waarschuwing

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

- Varoitus** Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).
- Attention** Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.
- Warnung** Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.
- Avvertenza** Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.

- Advarsel** Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet *Regulatory Compliance and Safety Information* (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.
- Aviso** Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento *Regulatory Compliance and Safety Information* (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.
- ¡Advertencia!** Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.
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An Overview of the Cisco IP Phone

The Cisco IP Phone provides functionality similar to that of a traditional analog phone, but must be configured and managed like other network devices.

You can choose among three models of Cisco IP Phones—Cisco IP Phone 7960, Cisco IP Phone 7940, and Cisco IP Phone 7910. Each Cisco IP Phone supports G.711, G.729, G.729a, G.729b, and G.729ab audio compression.

This section covers the following topics:

- [Understanding the Cisco IP Phone Models 7960 and 7940, page 1-2](#)
- [Understanding the Cisco IP Phone 7910, page 1-5](#)
- [What Networking Protocols Are Used?, page 1-7](#)
- [What Features are Supported on the Cisco IP Phone?, page 1-9](#)
- [Understanding the Requirements for Installing and Configuring the Cisco IP Phone, page 1-12](#)



Caution

Using a cell phone or mobile phone in close proximity to a Cisco IP Phone might cause interference.

Understanding the Cisco IP Phone Models 7960 and 7940

The Cisco IP Phone models 7960 and 7940 are full-featured, multiline telephones that provide voice communication over an IP network. These phones function as managerial-level office telephones, replacing traditional analog telephones in an IP telephony network.

The Cisco IP Phone model 7960 and 7940 differ only in the number of available line or speed dial buttons. The Cisco IP Phone 7940 has two lines, and the 7960 has six lines.

The main components of both models are illustrated in and [Figure 1-1](#) and [Figure 1-2](#), and defined in the table that follows.

Figure 1-1 Cisco IP Phone 7960



Figure 1-2 Cisco IP Phone 7940



| | | |
|---|--|---|
| 1 | Handset with indicator light | Functions like a traditional handset. The light strip at the top of the handset blinks when the phone rings and remains lit to indicate a new voice mail message. |
| 2 | LCD screen | Displays features such as the time, date, phone number, caller ID, line/call status and soft key tabs. |
| 3 | Cisco IP Phone model type | Indicates Cisco IP Phone model. |
| 4 | Line or speed dial button  | Opens a new line, speed dials the number on the LCD screen, or ends a call. The Cisco IP Phone 7960 has six line or speed dial buttons and the 7940 has two. |
| 5 | Footstand adjustment | Allows you to adjust the angle of the phone base. |
| 6 | Directories button  | Provides access to call histories and directories. |

| | | |
|----|--|--|
| 7 | ? button  | Displays help on LCD screen for a phone button or function and provides status information about the current call. |
| 8 | Settings button  | Provides access to phone settings such as contrast and ring sound, network configuration, and status information. |
| 9 | Speaker button  | Toggles the speaker on or off. |
| 10 | Mute button  | Toggles the mute on or off. |
| 11 | Headset button  | Toggles the headset on or off. |
| 12 | Volume button  | Increases or decreases volume for the handset, headset, or speakerphone (depending upon which is currently active). Also controls the ringer volume (if on-hook), and the LCD contrast. |
| 13 | Services button  | Provides access to phone services (if available). |
| 14 | Messages button  | Provides access to a message system (if available). |
| 15 | Navigation button  | Enables you to scroll through text and select features displayed on the LCD screen. |
| 16 | Dial pad | Works exactly like the dial pad on a traditional telephone. |
| 17 | Soft keys | Enable you to engage any of the functions displayed on the corresponding LCD tabs. Soft keys point to feature options displayed along the bottom of the LCD screen. Soft keys change depending on the status of the phone. |

Understanding the Cisco IP Phone 7910

The Cisco IP Phone 7910 is designed primarily for common-use areas that require basic features, such as lobbies, break rooms, and hallways.

The Cisco IP Phone 7910 is available in two configurations:

- Cisco IP Phone 7910—includes a single 10-BaseT connection
- Cisco IP Phone 7910+SW—includes an optional internal 3-port switch that allows a 100-Mbps connection

The main components of the Cisco IP Phone 7910 are illustrated in [Figure 1-3](#) and defined in the table that follows.

Figure 1-3 Cisco IP Phone 7910 Features



| | | |
|----|---|---|
| 1 | Handset with indicator light | Functions like a traditional handset. |
| 2 | LCD screen | Displays features such as time, date, directory number, caller ID, and line/call status. |
| 3 | Line button | Opens a new line. |
| 4 | Hold button | Puts a current call on hold or takes a call off hold. |
| 5 | Transfer button | Transfers the current caller to a different phone number. |
| 6 | Settings button | Adjust handset, speaker, and ringer volume, the ringer type, and contrast on the LCD screen. |
| 7 | Footstand adjustment | Allows you to adjust the angle of the phone base. |
| 8 | Messages button | Programmable with Cisco CallManager to suit the needs of your company. See the “Modifying Phone Button Templates” section on page 6-5 for additional information. The default setting for this button allows you to access voice mail message. |
| 9 | Conference button | Programmable with Cisco CallManager to suit the needs of your company. See the “Modifying Phone Button Templates” section on page 6-5 for additional information. The default setting for this button allows you to initiate a conference call. |
| 10 | Forward button | Programmable with Cisco CallManager to suit the needs of your company. See the “Modifying Phone Button Templates” section on page 6-5 for additional information. The default setting for this button allows you to redirect calls to another number. |
| 11 | Redial button | Programmable with Cisco CallManager to suit the needs of your company. See the “Modifying Phone Button Templates” section on page 6-5 for additional information. The default setting for this button allows you to dial the last number called. |
| 12 | Speaker button  | Toggles the speaker on or off. |

| | | |
|----|--|--|
| 13 | Mute button  | Toggles the Mute on or off. |
| 14 | Volume button  | Increases or decreases the volume for the handset or speaker. Also controls the ringer volume and the LCD contrast. |
| 15 | Speed dials | Programmable with Cisco CallManager to suit the needs of your company. See the “Modifying Phone Button Templates” section on page 6-5 for additional information. The default setting for this button allows you to quickly call a frequently dialed number. |
| 16 | Dialing pad | Functions like a traditional telephone dialing pad. |

What Networking Protocols Are Used?

Cisco IP Phones support several industry-standard and Cisco networking protocols required for voice communication. See [Table 1-1](#) for an overview of the supported networking protocols.

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

| Networking Protocol | Purpose | Usage Notes |
|--------------------------------|---|---|
| Bootstrap Protocol (BootP) | BootP enables a network device such as the Cisco IP Phone to discover certain startup information, such as its IP address. | If you are using BootP to assign IP addresses to the Cisco IP Phone, this is displayed in the network configuration settings on the phone. |
| 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 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. |

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

| Networking Protocol | Purpose | Usage Notes |
|--|---|---|
| Dynamic Host Configuration Protocol (DHCP) | <p>DHCP dynamically allocates and assigns an IP address to network devices.</p> <p>DHCP enables you to connect the IP phone into the network and become operational without manually assigning an IP address or configuring additional required network parameters.</p> | <p>DHCP is enabled by default. If disabled, you must manually configure the IP address, subnet mask, gateway, and an TFTP server on each phone locally.</p> <p>Cisco recommends that you use DHCP custom option 150. With this method, you configure the TFTP server IP address as the option value. For additional supported DHCP configurations, see the <i>Cisco CallManager System Guide</i>.</p> |
| Internet Protocol (IP) | IP is a messaging protocol that addresses and sends packets across the network. | <p>To communicate using IP, network devices must have an assigned IP address, subnet, and gateway.</p> <p>IP addresses, subnets, and gateways identifications are automatically assigned if you are using the Cisco IP Phone with Dynamic Host Configuration Protocol (DHCP). If you are not using DHCP, you must manually assign these properties to each phone locally.</p> |
| Real-Time Transport Protocol (RTP) | RTP is a standard for transporting real-time data, such as interactive voice and video over data networks. | Cisco IP Phones use the RTP protocol to send and receive real-time voice traffic from other phones and gateways. |
| Transmission Control Protocol (TCP) | TCP is a connection-oriented transport protocol. | Cisco IP Phones use TCP to connect to Cisco CallManager and to access XML services. |

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

| Networking Protocol | Purpose | Usage Notes |
|---------------------------------------|---|---|
| Trivial File Transfer Protocol (TFTP) | TFTP allows you to transfer files over the network. On the Cisco 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 more than one TFTP server is running in your network, you must manually assign a TFTP server to each phone locally. |
| User Datagram Protocol (UDP) | UDP is a connectionless messaging protocol for delivery of data packets. | Cisco IP Phones receive and process UDP messages. |

What Features are Supported on the Cisco IP Phone?

The Cisco IP Phone functions much like a traditional analog phone, allowing you to place and receive telephone calls.

In addition to these traditional telephony features, the Cisco IP Phone includes features that enable you to administer and monitor the phone as an IP networking device.

This section covers the following topics:

- [Feature Overview, page 1-10](#)
- [Configuring Telephony Features Using Cisco CallManager Administration, page 1-10](#)
- [Configuring Network Features Using the IP Phone, page 1-11](#)
- [Providing Users with Feature Information, page 1-11](#)

Feature Overview

Cisco IP Phones provide traditional telephony functionality, such as call forwarding and transferring, redialing, speed dialing, conference calling, and voice mail access. For an overview of all the supported telephony features and tips on configuring them, see the [“Configuring Cisco IP Phones in Cisco CallManager”](#) section on page 6-2.

Because the Cisco IP Phones are connected to the rest of your IP network, they can interact with other services and devices to provide enhanced functionality. For example, you can integrate the Cisco IP Phones with the corporate Lightweight Directory Access Protocol 3 (LDAP3) standard directory to enable users to search for co-workers contact information directly from their IP phone. Or, you can use XML to enable users to access information such as weather, stocks, quote of the day or other Web-based information. For information about configuring these services, see the [“Configuring Corporate Directories”](#) section on page 6-8 and the [“Setting Up User Services”](#) section on page 6-8.

Finally, because the Cisco IP Phone is a network device, you can obtain detailed status information from it directly. This information can assist you in troubleshooting any problems users might encounter when using their IP phones. See [Chapter 7, “Troubleshooting the Cisco IP Phone”](#) for tips on using this information.

Configuring Telephony Features Using Cisco CallManager Administration

You can modify additional settings from the Cisco CallManager Administration application. Use this web-based application to set up phone registration criteria and calling search spaces, configure corporate directories and services, and modify phone button templates, among other tasks. See the [“Configuring Cisco IP Phones in Cisco CallManager”](#) section on page 6-2 and the *Cisco CallManager Administration Guide* for additional information.

If you are not familiar with the Cisco CallManager Administration application, use the context-sensitive help available within the application for guidance. You can access context-sensitive help by choosing **Help > For this screen** from the main menu bar.

This guide provides partial instructions for procedures that involve Cisco CallManager Administration. These instructions are intended to point you to the appropriate window in the Cisco CallManager application and to provide some initial guidance.

For detailed information about using Cisco CallManager, refer to the Cisco CallManager documentation suite available at this location:

http://www.cisco.com/univercd/cc/td/doc/product/voice/c_callmg/index.htm

Configuring Network Features Using the IP Phone

You can locally configure features 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 5, “Configuring Network Settings on the Cisco IP Phone”](#) and [Chapter 7, “Troubleshooting the Cisco IP Phone.”](#)

Providing Users with Feature Information

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

http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/index.htm.

From this site, you can view and order various user guides, including wallet cards. For complete ordering information, see the [“Obtaining Documentation” section on page -xii](#).

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

For a summary of some of the key information that phone users need their system administrators to provide, see the [“Providing Information to End Users” section on page 6-9](#).

Understanding the Requirements for Installing and Configuring the Cisco IP Phone

To install and configure the Cisco IP Phone, you must configure some network settings, set up Cisco CallManager, and make changes locally on the phone.

Refer to [Table 1-2](#) for an overview of required procedures. For detailed information about these steps, refer to the referenced sources.

Table 1-2 Overview of Configuration Procedures for the Cisco IP Phone

| Required Task | Purpose | For More Information |
|---|--|---|
| <ol style="list-style-type: none"> 1. Gather the following information about the phone: <ul style="list-style-type: none"> – Model – MAC address – Physical location of the phone – Cisco CallManager user to associate with the phone – Partition, calling search space, and location information, if used – Number of lines and associated directory numbers to assign to the phone – Features to be added and configured to the phone | <p>Required to configure Cisco CallManager to support the Cisco IP Phones.</p> | <p>See the following:</p> <ul style="list-style-type: none"> • “Adding Phones to the Cisco CallManager Database” section on page 2-10 • “Configuring Cisco IP Phones in Cisco CallManager” section on page 6-2 • <i>Cisco CallManager System Guide</i> • <i>Cisco CallManager Administration Guide</i>. |
| <ol style="list-style-type: none"> 2. Configure routers, gateways, and switches to handle voice communication. | <p>Establishes the infrastructure for the IP telephony network.</p> | <p>See the “Understanding How the Cisco IP Phone Interacts with the Cisco Catalyst Family of Switches” section on page 2-2 and the documentation included with these devices.</p> |

Table 1-2 Overview of Configuration Procedures for the Cisco IP Phone (continued)

| Required Task | Purpose | For More Information |
|---|---|--|
| 3. Add the phone to Cisco CallManager. | Provides call processing in the IP telephony network. | See the “ Adding Phones to the Cisco CallManager Database ” section on page 2-10 and the <i>Cisco CallManager Administration Guide</i> . |
| 4. Choose to auto-register phones, add them to the Cisco CallManager database manually, or use Bulk Administration (BAT) to add many phones to the database simultaneously. | Determines how the phone is added to Cisco CallManager and how the directory number is assigned. | See the “ Adding Phones to the Cisco CallManager Database ” section on page 2-10 and the <i>Cisco CallManager Administration Guide</i> . |
| 5. Choose to power through the Cisco AC adapter or Cisco Catalyst switch. | Determines whether the phone receives power from an external power source over a power cord or from the in-line power source over the Ethernet cable. | See the “ Providing Power to the Cisco IP Phone ” section on page 2-7 or the documentation included with the Cisco Catalyst switch. |
| 6. Install the phone in the network. | Adds the phone to the network. | See Chapter 3, “Installing the Cisco IP Phone” . |
| 7. Add a 7914 Expansion Module. | Extends functionality to the Cisco IP Phone 7960 by adding 14 line appearances and/or speed dial numbers. | See the “ Adding the Cisco IP Phone 7914 Expansion Module ” section on page 4-1 . |
| 8. Configure network settings on the Cisco IP Phone 7960. | Sets IP settings (if not using DHCP in the network) and assigns a TFTP server. | See the “ Configuring IP Settings ” section on page 5-14 and the “ Configuring TFTP Options ” section on page 5-21 . |

Table 1-2 Overview of Configuration Procedures for the Cisco IP Phone (continued)

| Required Task | Purpose | For More Information |
|--|--|---|
| 9. Configure the phone features such as call waiting, call forward, call park, and call pickup. | Provides enhanced telephony functionality. | See the “ Configuring Cisco IP Phones in Cisco CallManager ” section on page 6-2 and the <i>Cisco CallManager Administration Guide</i> . |
| 10. Modify button templates. | Provides customized phone buttons. | See the “ Modifying Phone Button Templates ” section on page 6-5. |
| 11. Configure Cisco IP phone services. | Allows users to quickly access information such as weather, stocks, quote of the day or any Web-based information using extensible markup language (XML). | See the “ Setting Up User Services ” section on page 6-8 or the <i>Cisco CallManager Administration Guide</i> . |
| 12. Configure corporate directories. | Integrates with a LDAP3 standard directory, enabling users to search through a corporate directory. | See the “ Configuring Corporate Directories ” section on page 6-8 or the <i>Cisco CallManager Administration Guide</i> . |
| 13. Add users to Cisco CallManager. | Associates a user with a phone, enabling access to the User Options web-based application where users set up features such as call forwarding and speed dial, and subscribe to services. | See Chapter 6, “Configuring Cisco IP Phones, Users, and Features in Cisco CallManager” and the <i>Cisco CallManager Administration Guide</i> or context-sensitive help. |
| 14. Provide information to end users about how to user their phone and how to configure their phone options. | Ensures users have adequate information to successfully use their Cisco IP Phone. | See the “ Setting Up User Services ” section on page 6-8. |



Preparing to Install the Cisco IP Phone on Your Network

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

These sections provide you with an important overview of the interaction between Cisco IP Phones and other key components of the Voice over IP (VoIP) network:

- [Understanding Interactions with Other Cisco IP Telephony Products, page 2-1](#)
- [Understanding the Phone Startup Process, page 2-3](#)
- [Guidelines for Configuring Ports on Cisco IP Phones, page 2-6](#)
- [Adding Phones to the Cisco CallManager Database, page 2-10](#)
- [Configuring the Cisco IP Phone 7960 to Support the 7914 Expansion Module, page 2-15](#)

Understanding Interactions with Other Cisco IP Telephony Products

To function in the IP telephony network, the Cisco IP Phone must be connected to a networking device, such as a Cisco Catalyst switch. You must also register the Cisco IP Phone with a Cisco CallManager system in order to send and receive calls.

This section covers the following topics:

- [Understanding How the Cisco IP Phone Interacts with Cisco CallManager, page 2-2](#)
- [Understanding How the Cisco IP Phone Interacts with the Cisco Catalyst Family of Switches, page 2-2](#)

Understanding How the Cisco IP Phone Interacts with Cisco CallManager

Cisco CallManager is an open and industry-standard call processing system. Cisco CallManager software runs on a Windows 2000 server and sets up and tears down calls between phones, integrating traditional PBX functionality with the corporate IP network. Cisco CallManager manages the components of the IP telephony system—the phones, access gateways, and the resources necessary for such features as call conferencing and route planning.

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

Understanding How the Cisco IP Phone Interacts with the Cisco Catalyst Family of Switches

Cisco IP Phones have an internal Ethernet switch, enabling them to switch incoming traffic to the phone, the access port, or to the network port (see the [“Connecting to the Network”](#) section on page 2-6 for details).

If a computer is connected to the access port, data packets traveling to and from the computer, and to and from the phone, share the same physical link to the switch and the same port on the switch.

This shared physical link has the following implications for the VLAN configuration on the network:

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

You can resolve these issues by isolating the voice traffic onto a separate VLAN on each of the ports connected to a phone. The switch port configured for connecting a phone would have separate VLANs configured for carrying:

- Voice traffic to and from the IP phone (auxiliary VLAN)
- Data traffic to and from the PC connected to the switch through the access port of the IP phone (native VLAN)

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

For more information, refer to the documentation included with the Cisco Catalyst switch.

**Note**

The Cisco IP Phone 7910 does not have an access port. If you require an access port on this phone model, use the Cisco IP Phone 7910+SW instead.

Understanding the Phone Startup Process

When connecting to the VoIP network, the Cisco IP Phone goes through a standard startup process comprised of seven steps. Some of these steps might not occur, depending on the configuration of your specific network.

Each of these steps is described in the sections that follow:

- [Obtaining Power from the Switch, page 2-4](#)
- [Loading the Stored Phone Image, page 2-4](#)
- [Configuring VLAN, page 2-4](#)
- [Obtaining an IP Address, page 2-4](#)

- [Accessing TFTP Server, page 2-5](#)
- [Requesting the Configuration File, page 2-5](#)
- [Contacting Cisco CallManager, page 2-5](#)

Obtaining Power from the Switch

You can connect the Cisco IP Phone to a Cisco Catalyst switch with one of the modules that provides power to the phone (WS-X6348-RJ45V). See the [“Providing Power to the Cisco IP Phone” section on page 2-7](#) for details.

If you use this optional configuration, the phone receives phantom power and powers up when you connect the Cisco IP Phone to the switch. The phone then sends Cisco Discovery Protocol (CDP) notifications to the switch indicating it is ready to receive CDP packets and indicating the power requirement for the phone. The switch allocates power and sends it over the network cable.

Loading the Stored Phone Image

The Cisco 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.

Configuring VLAN

If the Cisco 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.

Obtaining an IP Address

If the Cisco 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.

Accessing TFTP Server

In addition to assigning an IP address, the DHCP server also directs the Cisco IP Phone to a TFTP Server. If the phone has a statically defined IP address, you must configure the TFTP server locally on the phone; the phone then goes to the TFTP server directly.

Requesting the Configuration File

The TFTP server has configuration files (.cnf file format) for telephony devices, which define parameters for connecting to Cisco CallManager. In general, any time you make a change in Cisco CallManager that requires the phone (device) to be reset, a change has been made to the phone's configuration file.

If a phone has an XML-compatible load, it requests a .XMLDefault.cnf.xml format configuration file; otherwise, it requests a .cnf file.

If you have enabled auto-registration in Cisco CallManager, the phones access a default configuration file (sepdefault.cnf.xml) from the TFTP server. If you have manually entered the phones into the Cisco CallManager database, the phone accesses a .cnf.xml file corresponding to its device name.

The .cnf.xml file also contains the information telling the phone which image load it should be running. If this image load differs from the one currently loaded on the phone, the phone contacts the TFTP server to request the new image file, which is stored as a .bin file.

Contacting Cisco CallManager

The configuration file defines how the Cisco IP Phone communicates with Cisco CallManager. After obtaining the file from the TFTP server, the phone next attempts to make a TCP connection to the highest priority Cisco CallManager on the list.

If the phone was manually added to the database, Cisco CallManager identifies the phone. If the phone was not manually added to the database and auto-registration is enabled in Cisco CallManager, the phone attempts to auto-register itself in the Cisco CallManager database.

Cisco CallManager informs devices using .cnf format configuration files of their load ID. Devices using .xml format configuration files receive the load ID in the configuration file.

Guidelines for Configuring Ports on Cisco IP Phones

Cisco IP Phones include ports for connecting the phones to the network, for providing power to the phones, and for adding headsets to the phones. These sections provide tips for configuring these ports:

- [Connecting to the Network, page 2-6](#)
- [Providing Power to the Cisco IP Phone, page 2-7](#)
- [Configuring the Handset, Headset, and Speakerphone, page 2-8](#)

Connecting to the Network

The Cisco IP Phones have two RJ-45 ports labelled “network” and “access.” Each supports 10/100 Mbps half- or full-duplex connections to external devices. You can use either Category 3 or 5 cabling for 10-Mbps connections, but you must use Category 5 for 100 Mbps connections. On both the network port and access port, use full-duplex mode to avoid collisions.

**Note**

The Cisco IP Phone 7910 does not have an access port. If you require an access port on this phone model, use the Cisco IP Phone 7910+SW instead.

Refer to [Figure 3-1](#) and [Figure 3-2](#) to see the connection ports available on the back of the Cisco IP Phone models 7960/7940 and 7910.

Using the Network Port

Use the network port to connect the phone to the network. You must use a straight-through cable on this port. The phone can also obtain inline power from the Cisco Catalyst switch over this connection. See the [“Providing Power to the Cisco IP Phone” section on page 2-7](#) for details.

Using the Access Port

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

Providing Power to the Cisco IP Phone

You can power a Cisco IP Phone from an external power supply, from a switch port, or from a power source between the phone and the switch.

The Cisco IP Phone can be powered by the following sources:

- External power source—optional Cisco AC adapter and power cord for connecting to a standard wall receptacle.
- WS-X6348-RJ45V 10/100 switching module—inline power provider to the Cisco IP Phone when connected to a Catalyst 6000 family 10/100BaseTX switching module.

This module sends power on pins 1 & 2 and 3 & 6, which are also used to transmit Ethernet signals. Before the switch sends power, it tests for the presence of a Cisco IP Phone, avoiding damage to other Ethernet devices.



Note Only the network port supports inline power from the Cisco Catalyst switches.

- WS-PWR-PANEL—power patch panel that allows the Cisco IP Phone to be connected to existing Catalyst 4000, 5000, and 6000 family 10/100BaseTX switching modules.

This module sends power on pins 4, 5, 7, & 8, which are not used for Ethernet signaling. Like the inline power, the power patch panel also attempts to verify that the attached device is a Cisco IP Phone before providing power.

Power Source Design

The phone and switch automatically determine which power source the phone uses. If the power has to be switched to a different source, the phone user will experience different results based on which power source is being used by the phone.

Use the following information to choose a power source for the phone:

- If you plug a phone into the optional power supply before plugging it into the network, the phone is powered by the power supply.
- If you then unplug the phone from the power supply, the phone resets. If the switch port is configured for 10/100 Mbps, the switch recognizes the loss of power and brings the phone back up.
- If the switch port is configured for 10 Mbps only, then you must unplug the network connection and plug it back into the phone for the switch to recognize the phone's loss of power.
- If, however, you plugged the network connection into the phone before you plugged in the power cord, the phone receives power through the switch, and unplugging the power cord will not bring down the phone. If the switch reboots, the phone will then be powered by the power cord.

Redundancy Feature

For redundancy, you can use the Cisco AC adapter even if you are using inline power from the Cisco Catalyst switches. The Cisco IP Phone can share the power load being used from the inline power and external power source. If either the inline power or the external power goes down, the phone can switch entirely to the other power source.

To use this redundancy feature:

1. Set the inline power mode to auto on the Cisco Catalyst switch.
2. Connect the unpowered Cisco IP Phone to the network.
3. Connect the external power supply to the phone after the phone powers up.

Configuring the Handset, Headset, and Speakerphone

Cisco IP Phones enable you to connect a headset to them or use the built-in speakerphone to make calls rather than the standard handset. These sections provide you with additional information about configuring these options:

- [Connecting a Handset to a Cisco IP Phone, page 2-9](#)
- [Connecting a Headset to a Cisco IP Phone, page 2-9](#)
- [Disabling the Speakerphone Feature, page 2-10](#)

Connecting a Handset to a Cisco IP Phone

All Cisco IP Phones include a handset designed especially for use with a Cisco IP Phone. These handsets are interchangeable among Cisco IP Phone models. The handsets include a light strip used to indicate voice mail messages.

To place and answer calls using a handset, plug the included handset into the back of the phone base (see the “[Connecting the Cisco IP Phone to the Network](#)” section on page 3-4 for details) and pick up the handset.

Connecting a Headset to a Cisco IP Phone

You can use a headset with any Cisco IP Phone. These sections help you determine the headset supported by a particular Cisco IP Phone:

- [Using a Headset with a Cisco IP Phone Model 7960 or 7940, page 2-9](#)
- [Using a Headset with a Cisco IP Phone 7910, page 2-10](#)

Using a Headset with a Cisco IP Phone Model 7960 or 7940

To place and answer calls using a headset, plug an approved headset into the back of the phone base (see the “[Connecting the Cisco IP Phone to the Network](#)” section on page 3-4 for details) and press the **Headset** button on the front of your phone.

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

The Cisco IP Phone models 7960 and 7940 support four- or six-wire headset jacks. For information on the exact models supported, see the following URLs:

- <http://cisco.getheadsets.com>
- <http://vxicorp.com/cisco>

To disable the headset on these models, choose **Device > Phone** from the Cisco CallManager Administration application and locate the phone you want to modify. Check the **Disable Speakerphone and Headset** check box to disable the speakerphone for the phone you have selected.

Using a Headset with a Cisco IP Phone 7910

The Cisco IP Phone 7910 does not have a separate headset jack. However, you can use a headset in place of the handset. You can use industry-standard headsets, such as Plantronics M-12 amplified headsets or other headsets that provide switch capability between the headset and handset.

Disabling the Speakerphone Feature

By default, the speakerphone is enabled on Cisco IP Phones. However, you can disable it on Cisco IP Phone models 7960 and 7940.

To disable the speakerphone on these models, choose **Device > Phone** from the Cisco CallManager Administration application and locate the phone you want to modify. Check the **Disable Speakerphone** check box to disable the speakerphone for the phone you have selected.

Adding Phones to the Cisco CallManager Database

Before installing any Cisco IP phones, you must make decisions about how you want the phones to be added to the Cisco CallManager database. Because Cisco CallManager handles call processing in the network, this is a critical step.

You can add phones to the Cisco CallManager database automatically using auto-registration, manually using the Cisco CallManager Administration application, or in groups with the Bulk Administration Tool (BAT).

Once you add a Cisco IP phone using the Cisco CallManager Administration application, the Phone Configuration Window in the application displays the device name, registration status, and the IP address of the Cisco CallManager to which the device is registered.

This section covers the following topics:

- [Using Auto-Registration, page 2-11](#)
- [Adding Phones Manually, page 2-12](#)
- [Using the Bulk Administration Tool, page 2-15](#)

**Tip**

To get help using the Cisco CallManager application, access context-sensitive help by choosing **Help > For this screen** from the main menu bar. For complete instructions and conceptual information, refer to the *Cisco CallManager Administration Guide* and the *Cisco CallManager System Guide*.

Using Auto-Registration

Use auto-registration if you want Cisco CallManager to assign directory numbers automatically to new phones as they connect to the IP telephony network. Once a phone has auto-registered, you can move it to a new location and assign it to a different device pool without affecting its directory number.

With auto-registration enabled, Cisco CallManager begins the automatic startup process to obtain a directory number as soon as you connect the Cisco IP Phone to the network. During auto-registration, Cisco CallManager automatically assigns the next available sequential directory number to the phone.

Use auto-registration to quickly get all phones into the Cisco CallManager database. You can then modify any settings, such as the directory numbers, from Cisco CallManager. If you do not use auto-registration, you must manually add phones to the Cisco CallManager database or use the Bulk Administration Tool (BAT).

Use the following procedure as a starting point to enable auto-registration using the Cisco CallManager Administration application. For additional information, access context-sensitive help from the application or refer to Cisco CallManager documentation.

Procedure

- Step 1** Log in to the Cisco CallManager Administration application.
- Step 2** From the menu bar, choose **System > Cisco CallManager**.
The Cisco CallManager Configuration window appears.
- Step 3** Verify that the “Auto-registration disabled on this Cisco CallManager” setting is not checked. Cisco CallManager disables the auto-registration by default to prevent unauthorized connections to the network.

- Step 4** To modify phone settings, choose **Device > Phone**. Use the Find and List Phones window to enter search criteria for each phone.
- Step 5** Install the phone by following the instructions in [Chapter 3, “Installing the Cisco IP Phone.”](#)
- Step 6** To configure additional phone features, see the [“Configuring Cisco IP Phones in Cisco CallManager” section on page 6-2](#) for details.
-

Adding Phones Manually

If you want to assign specific directory numbers to a specific Cisco IP Phone without using auto-registration, you can manually add each phone to the Cisco CallManager database or use the Bulk Administration Tool (BAT).

If you want to add phones manually, and are not using Dynamic Host Configuration Protocol (DHCP) in your network, then you must configure the IP settings and Trivial File Transfer Protocol (TFTP) server locally on each phone.

Alternatively, if you use DHCP, but want to manually set the TFTP server, then allow the phone to start up, using DHCP, before re-assigning the TFTP server.

Refer to these topics for more information:

- [Adding Phones Manually Using DHCP, page 2-12](#)
- [Assigning Static IP Addresses, page 2-13](#)

Adding Phones Manually Using DHCP

If you are using DHCP in your network, but you are not using auto-registration, you can manually add a phone to the Cisco CallManager database. If you are using DHCP, you do not need to assign IP addresses or TFTP servers.

Use the following procedure as a starting point to add phones manually using the Cisco CallManager Administration application.

Procedure

- Step 1** Log in to the Cisco CallManager Administration application.
- Step 2** From the menu bar, choose **Device > Add a New Device**.
The Add a New Device window appears.
- Step 3** Select **Phone** from the Device Type drop-down menu and click **Next**.
The Add a New Phone window appears.
- Step 4** Select a phone type from the drop-down menu and click **Next**.
The Phone Configuration window appears. The fields displayed in this window depend upon the phone type selected.
- Step 5** In the Phone Configuration window, you must enter information in the following three fields:
- MAC Address
 - Device Pool
 - Phone Button Template
- Step 6** Click **Insert**.
The Cisco CallManager Administration application asks if you want to assign a directory number.
- Step 7** To configure additional phone features, see the [“Configuring Cisco IP Phones in Cisco CallManager”](#) section on page 6-2 for details.
For additional information, access context-sensitive help from the application or refer to Cisco CallManager documentation.
-

Assigning Static IP Addresses

If you do not use DHCP in your network, you must assign static IP addresses to each phone. You must configure each phone locally.

Use the following procedure as a starting point to add phones manually using the Cisco CallManager Administration application.

Procedure

- Step 1** Log in to the Cisco CallManager Administration application.
- Step 2** From the menu bar, choose **Device > Add a New Device**.
The Add a New Device window appears.
- Step 3** Select **Phone** from the Device Type drop-down menu and click **Next**.
The Add a New Phone window appears.
- Step 4** Select a phone type from the drop-down menu and click **Next**.
The Phone Configuration window appears. The fields displayed in this window depend upon the phone type selected.
- Step 5** In the Phone Configuration window, you must enter information in the following three fields:
- MAC Address
 - Device Pool
 - Phone Button Template
- Step 6** Click **Insert**.
The Cisco CallManager Administration application asks if you want to assign a directory number.
- Step 7** Enter the required fields.
- Step 8** Install the phone by following the instructions in the [Chapter 3, “Installing the Cisco IP Phone.”](#)
- Step 9** Configure the IP settings by following the instructions in the [“Configuring IP Settings” section on page 5-14.](#)
- Step 10** Configure the TFTP server by following the instructions in the [“Configuring TFTP Options” section on page 5-21.](#)
- Step 11** To configure additional phone features, see the [“Configuring Cisco IP Phones in Cisco CallManager” section on page 6-2](#) for details.
-

Using the Bulk Administration Tool

The Cisco Bulk Administration Tool (BAT) is a plug-in application for Cisco CallManager that enables system administrators to perform batch operations, including registration, on large numbers of Cisco IP Phones.

Refer to the *Bulk Administration Tool Guide for Cisco CallManager* for information about using BAT in your network.

Configuring the Cisco IP Phone 7960 to Support the 7914 Expansion Module

The Cisco IP Phone 7914 Expansion Module attaches to a Cisco IP Phone 7960 to extend the number or line appearances and/or speed dial buttons.

Before the 7914 Expansion Module can be used, you must access the Cisco CallManager Administration application. Use the application to perform the tasks detailed in the following sections:

Follow these steps to configure the Cisco IP Phone 7960 to support the 7914 Expansion Module.

Before You Begin

You might also want to customize the button templates for the 7914 Expansion Module. See the [“Modifying Phone Button Templates” section on page 6-5](#) for details.

Procedure

- Step 1** Log in to the Cisco CallManager Administration application.
The Cisco CallManager Administration page appears.
- Step 2** From the menu, choose **Device > Phone**.
The Find and List Phone page appears. You can search for one or more phones that you want to configure for the 7914 Expansion Module.
- Step 3** Select and enter your search criteria and click **Find**.

The Find and List Phone page re-displays showing a list of the phones matching your search criteria.

Step 4 Click on the IP Phone that you want to configure for the 7914 Expansion Module.

The Phone Configuration page appears.

Step 5 Scroll down to the Phone Button and Expansion Module Template Information section of the page.

Step 6 To add support for one Expansion Module, in the Expansion Module 1 field, select **Default 7914**.

To add support for a second Expansion Module, in the Expansion Module 2 field, select **Default 7914**.

In the Firmware Load Information section of the page, there are two fields for specifying the firmware load for Expansion Modules 1 and 2. You can leave these fields blank to use the default firmware load.

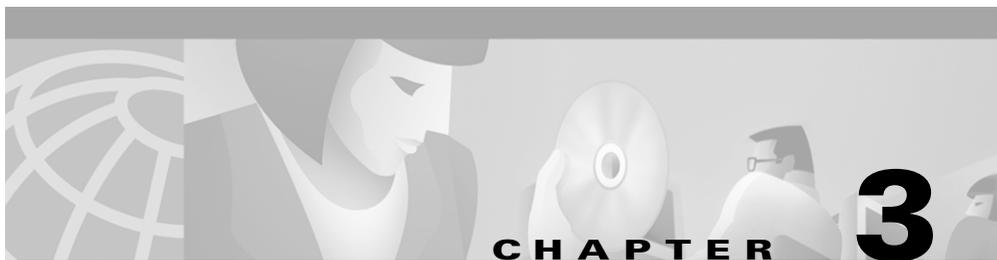
Step 7 Scroll back to the top of the page and click **Update**.

A message displays asking you to reset the phone for the changes to take effect. Click **OK**.

Step 8 Click **Reset Phone** for the changes to take effect.

**Note**

Make sure you tell your users how to access their IP Phone User Options application Web pages so that they can subscribe to the Speed Dial Service and set up the speed dial buttons on their Expansion Modules. See the [“Providing Information to End Users” section on page 6-9](#) for more details.



Installing the Cisco IP Phone

These topics help you install the Cisco IP Phone on an IP telephony network:

- [Before You Begin, page 3-1](#)
- [Connecting the Cisco IP Phone to the Network, page 3-4](#)
- [Adjusting Placement of the Cisco IP Phone, page 3-7](#)
- [Verifying the Phone Startup Process, page 3-9](#)
- [Configuring Startup Network Settings, page 3-10](#)



Note

For each Cisco IP phone that you install in your network, you must first make some critical decisions about how to configure the phone in your network. You can then safely install the phone and verify its functionality. For information on preparing to install, see [Chapter 2, “Preparing to Install the Cisco IP Phone on Your Network.”](#)

Before You Begin

Before installing a Cisco IP Phone, verify that your network meets the requirements and that Cisco CallManager is properly configured. Most importantly, review the safety precautions. See the [“Safety” section on page 3-3](#) for more details.

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

- [Network Requirements, page 3-2](#)
- [Cisco CallManager Configuration, page 3-2](#)
- [Safety, page 3-3](#)

Network Requirements

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

- Working VoIP Network
 - Voice over IP (VoIP) configured on your Cisco routers and gateways
 - Cisco CallManager Release 3.0 or higher 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

Cisco CallManager Configuration

The Cisco IP Phone requires Cisco CallManager to handle call processing. Refer to the *Cisco CallManager Administration Guide* or context-sensitive help in the Cisco CallManager application to ensure that Cisco CallManager 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 CallManager before connecting any Cisco IP Phone to the network. See the [“Using Auto-Registration” section on page 2-11](#) for details.

In Cisco CallManager, you can add users to the database and associate them with specific phones. By doing this, users gain access to web pages that allow them to configure phone options such as call forwarding, speed dialing, and voice mail. See the [“Adding Users to Cisco CallManager” section on page 6-5](#) for details.

Safety

Review the following warnings before installing the Cisco IP Phone.



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

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.

The following warning applies when you use an external power supply.



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.

Connecting the Cisco IP Phone to the Network

You must connect the Cisco IP Phone to the network and to a power source before using it. Refer to [Figure 3-1](#) and [Figure 3-2](#) for graphical overviews of the procedures that follow.

To install a Cisco IP Phone, perform these steps.

Procedure

Step 1 Connect a Category 3 or 5 straight-through Ethernet cable from the switch to the *network* port on the phone.

See the [“Connecting to the Network”](#) section on page 2-6 for guidelines. Each Cisco IP Phone ships with one Ethernet cable in the box.

Step 2 Connect the handset and headset to their respective ports.

See the [“Connecting a Headset to a Cisco IP Phone”](#) section on page 2-9 for supported headsets.

Step 3 Connect a Category 3 or 5 straight-through Ethernet cable from another network device, such as a desktop computer, to the *access* port on the phone (optional).

See the [“Connecting to the Network”](#) section on page 2-6 for guidelines.

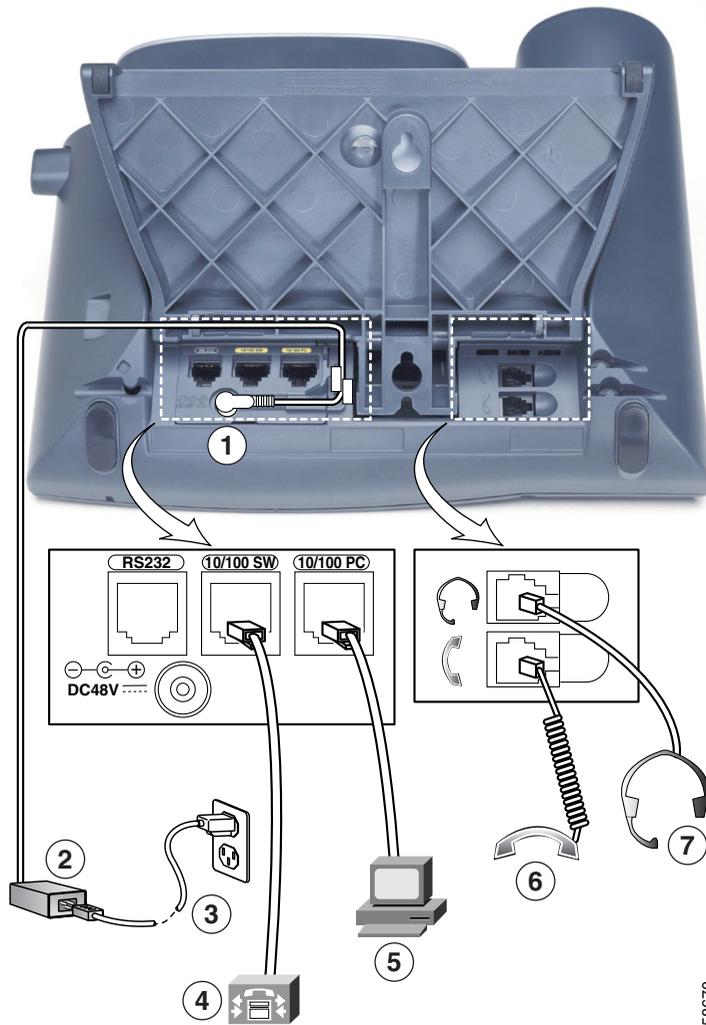


Note This option is not available on all Cisco IP Phone 7910 models. There are two versions of this phone and their only distinction is whether the access port is present. The Cisco IP Phone 7910+SW has an access port, and the Cisco IP Phone 7910 does not.

Step 4 Connect the power plug to the Cisco AC Adapter port (optional).

See the [“Providing Power to the Cisco IP Phone”](#) section on page 2-7.

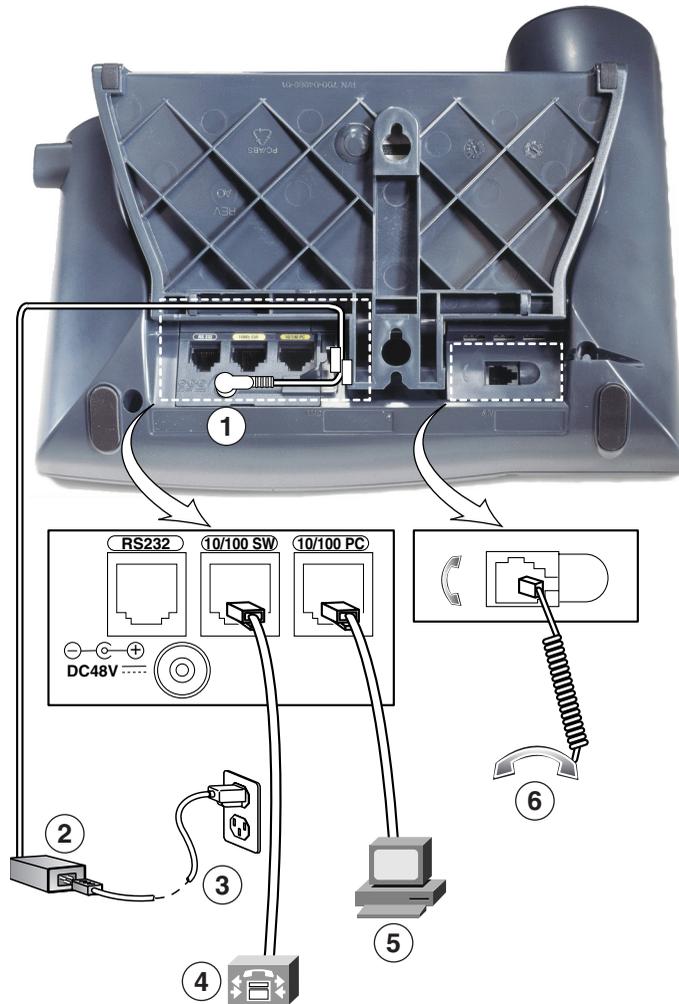
Figure 3-1 Cisco IP Phone Models 7960 and 7940 Cable Connections



58670

| | | | |
|---|--|---|-------------------------|
| 1 | AC adapter port (DC48V) | 5 | Access port (10/100 PC) |
| 2 | Power supply with AC adapter port plug | 6 | Handset port |
| 3 | Power cable with wall socket plug | 7 | Headset port |
| 4 | Network port (10/100 SW) | | |

Figure 3-2 Cisco IP Phone Model 7910 Cable Connections



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| | | | |
|----------|--|----------|--------------------------|
| 1 | AC adapter port (DC48V) | 4 | Network port (10/100 SW) |
| 2 | Power supply with AC adapter port plug | 5 | Access port (10/100 PC) |
| 3 | Power cable with wall socket plug | 6 | Handset port |

Adjusting Placement of the Cisco IP Phone

The Cisco IP Phone includes an adjustable footstand. When placing the phone on a desktop surface, you can adjust the tilt height to several different angles in 7.5 degree increments from flat to 60 degrees. You can also mount the phone to the wall using the footstand or using the optional locking accessory.

Adjusting Cisco IP Phone Placement on the Desktop

Adjust the footstand to the height that provides optimum viewing of the LCD screen.

Procedure

-
- | | |
|---------------|---|
| Step 1 | Push in the footstand adjustment knob. |
| Step 2 | Adjust the footstand to desired height. |
-

Mounting the Phone to the Wall

You can mount the Cisco IP Phone on the wall using the footstand as a mounting bracket, or you can use special brackets available in a Cisco IP Phone wall mount kit. (A wall mount kit must be ordered separately from the phone.) If you attach the Cisco 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 IP phone to the wall

Use the following procedure to mount the phone on the wall using the standard footstand. Refer to [Figure 3-3](#) for a graphical overview of these procedures.

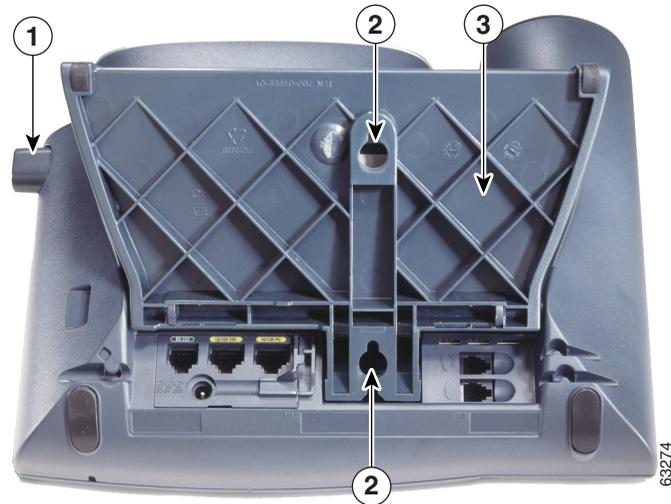
Before You Begin

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, see *Installing the Wall Mount Kit for the Cisco IP Phone*.

Procedure

- Step 1** Push in the footstand adjustment knob.
- Step 2** Adjust the footstand so it is flat against the back of the phone.
- Step 3** Modify the handset rest so that the handset remains on the ear-piece rest when the phone is vertically placed.
- Remove the handset from the ear-piece rest.
 - Locate the tab (handset wall hook) at the base of the ear-piece rest.
 - Slide this tab out, rotate it 180 degrees (left to right), and reinsert it.
 - Place the handset on the ear-piece rest.
- Step 4** 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 5** Hang the phone on the wall.
-

Figure 3-3 Parts Used in Wall Mounting the Cisco IP Phone



| | |
|---|--|
| 1 | Footstand adjustment knob—Raises and lowers adjustment plate |
| 2 | Wall mounting screw holes |
| 3 | Adjustment plate—Raises and lowers phone vertically |

Verifying the Phone Startup Process

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

1. These buttons flash on and off in sequence:
 - Headset (on Cisco IP Phone models 7960 and 7940 only)
 - Mute
 - Speaker
2. The LCD screen displays the Cisco Systems, Inc., copyright screen.

3. These messages display as phone starts up:
 - Configuring VLAN
 - Configuring IP
 - Configuring CM List
 - Connecting
 - Registering
 - Requesting Template
4. The main LCD screen displays:
 - The date and time
 - Primary directory number
 - Soft keys (on Cisco IP Phone models 7960 and 7940 only)

If the phone successfully passes through these stages, it has started up properly. Otherwise, refer to the [“Resolving Startup Problems”](#) section on page 7-15.

Configuring Startup Network Settings

If you are not using DHCP in your network, you must configure these network settings on the Cisco 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 follow the procedures defined in [Chapter 5](#), [“Configuring Network Settings on the Cisco IP Phone.”](#)

Adding the Cisco IP Phone 7914 Expansion Module

The Cisco IP Phone 7914 Expansion Module attaches to the Cisco IP Phone 7960 and extends its functionality by adding 14 line appearances and/or speed dial numbers per module. One or two Expansion Modules can be attached to your IP Phone. One Expansion Module provides a total of 20 line and/or speed dial numbers. Two Expansion Modules provide a total of 34 line and/or speed dial buttons, as shown in [Figure 4-1](#).

Figure 4-1 Cisco IP Phone 7960 with Two Expansion Modules



Installing the 7914 Expansion Module

These sections describe how to install the Expansion Module:

- [Before You Begin, page 4-2](#)
- [Connecting the 7914 Expansion Module, page 4-4](#)
- [Start Up Sequence, page 4-14](#)

Before You Begin

Before you begin the installation of the Cisco 7914 Expansion Module, read all of the following topics in this section:

- [Package List, page 4-2](#)
- [Footstand Kits, page 4-2](#)
- [Additional Equipment, page 4-3](#)
- [Safety Notices, page 4-3](#)

Package List

Make sure that you have received all of the following parts in your package:

- One Cisco IP Phone 7914 Expansion Module
- One RS 232 cable
- One Quick Start Guide
- One Warranty Card

Footstand Kits

In addition to the package list items, you will also need a Footstand Kit (separate orderable item). If you are attaching *one* 7914 Expansion Module, you need to have the *single* Footstand Kit. If you are attaching *two* 7914 Expansion Modules, you need to have the *double* Footstand Kit.

Each Footstand Kit contains:

- One support bar (single with one thumb screw, or double with two thumb screws)
- One footstand

Additional Equipment

You will need to have the following additional equipment.

- Small flat head screwdriver—for use during the installation
- Power supply unit—depending on how many Expansion Modules you are installing and how your Cisco IP Phone 7960 is powered, you will require power supply unit(s) as follows:

| | |
|---|--|
| Power over the Ethernet to your Cisco IP Phone 7960 | With one or two Expansion Modules, you need a power supply unit (separate orderable item). |
| Local power to your Cisco IP Phone 7960 | With one Expansion Module, no power supply unit needed. With two Expansion Modules, you need a power supply unit (separate orderable item). |

Note Use of a non-Cisco certified power supply unit may not work and will void the 7914 Expansion Module product warranty.

Safety Notices

These are the safety considerations for using the 7914 Expansion Module. Read these notices before you install or use the 7914 Expansion Module.



Warning

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.



Warning

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

**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**

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 use RJ-45 connectors. Use caution when connecting cables.

The following warnings apply when you use the external power supply with the 7914 Expansion Module:

**Warning**

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

**Warning**

The device is designed to work with TN power systems.

Connecting the 7914 Expansion Module

To connect the 7914 Expansion Module, you need to perform the following procedures. Each procedure corresponds to a section that contains detailed instructions and illustrations:

- [Removing the Footstand from the Cisco IP Phone 7960](#), page 4-5
- [Connecting the Support Bar to the Cisco IP Phone 7960](#), page 4-6
- [Connecting the 7914 Expansion Module to the Support Bar](#), page 4-7
- [Connecting the RS 232 Cable](#), page 4-9

- [Connecting the Power Supply, page 4-11](#)
- [Connecting the Footstand, page 4-12](#)

**Note**

To ensure a successful installation of the 7914 Expansion Module, make sure you have read the entire [“Before You Begin” section on page 4-2](#).

Removing the Footstand from the Cisco IP Phone 7960

To remove the footstand from the IP Phone 7960 to which you are attaching the 7914 Expansion Module, follow these steps.

Procedure

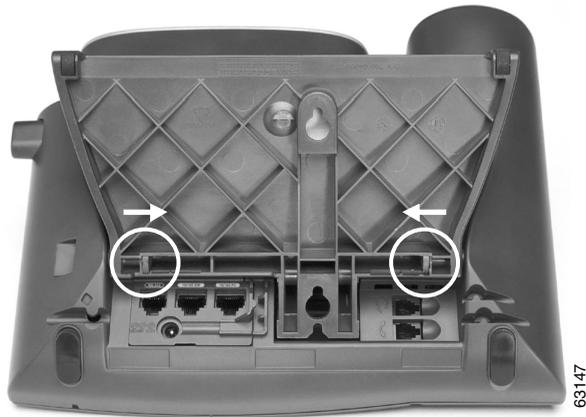
- Step 1** Unplug the Cisco IP Phone 7960 network and power connections.
- Step 2** Unplug the handset, and headset (if one is attached to the phone).
- Step 3** Turn the Cisco IP Phone 7960 over and lay it on a protected flat surface to prevent it from being scratched.
- Step 4** On the footstand, locate the two foot pins.
- Step 5** Using a flat head screwdriver, carefully push away from your body on one of the foot pins to release it. Then carefully push away from your body on the other foot pin to release it. Push the pins as illustrated in [Figure 4-2](#).

**Note**

You may have to lift and hold the IP Phone to support it when pushing the foot pins.

- Step 6** Lift off the footstand and store it separately.

Figure 4-2 Foot Pins on the Cisco IP Phone 7960



Connecting the Support Bar to the Cisco IP Phone 7960

To connect the support bar to the Cisco IP Phone 7960, follow these steps.

Procedure

- Step 1** Position the support bar on the back of the IP Phone so that it fits flush with the phone.
- Step 2** Locate the two connector pins, as illustrated in [Figure 4-3](#).
- Step 3** Using a flat head screwdriver, carefully push each of the connector pins so that the support bar is firmly fastened to the IP Phone.

Figure 4-3 Connector Pins on the Support Bar



Connecting the 7914 Expansion Module to the Support Bar

To connect the Expansion Module to the support bar, follow these steps.

Procedure

-
- Step 1** Position the phone so that the front of the phone is facing up.
- Step 2** Line up the two open slots on the bottom of the 7914 Expansion Module with the two hooks on the support bar. Insert the hooks into the slots and then rotate the top of the 7914 Expansion Module into the support bar so that it rests flush with the bar.
- Step 3** Tighten the thumb screw on the back of the 7914 Expansion Module.



Note If you are installing two Expansion Modules, repeat Steps 2 and 3 for the second Expansion Module.

Figure 4-4 Part Connections on the Expansion Module and Support Bar

735566

Figure 4-5 Thumb Screw Connections

| | |
|---|---|
| 1 | Slots on the 7914 Expansion Module |
| 2 | Hooks on the support bar |
| 3 | Insert and rotate the Expansion Module into the support bar |
| 4 | Tighten the thumb screws |

Connecting the RS 232 Cable

To connect the RS 232 cable, follow these steps, and refer to the following table, which depicts the “in” and “out” icons on the RS 232 jacks.

| In icon | Out icon |
|---------|----------|
| | |

Procedure

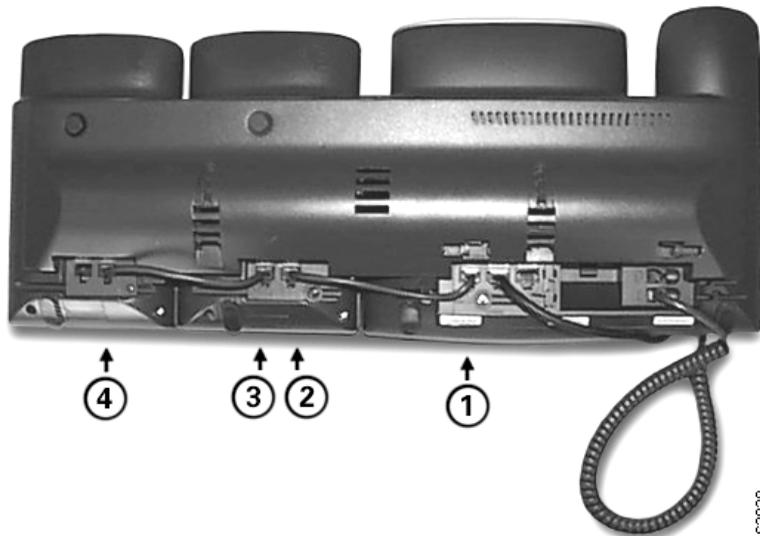
- Step 1** Plug one end of the RS 232 cable into the jack labeled RS 232 on the Cisco IP Phone 7960, as shown in [Figure 4-6](#).
- Step 2** Plug the other end of the RS 232 cable into the RS 232 jack with the “in” icon underneath on the 7914 Expansion Module.

**Note**

If you are installing a *second* 7914 Expansion Module, continue with Steps 3 and 4. Otherwise go to the “[Connecting the Power Supply](#)” section on page 4-11. Refer to [Figure 4-6](#) for an illustration of cable connections.

- Step 3** Plug one end of the second RS 232 cable into the RS 232 jack with the “out” icon underneath on the *1st* Expansion Module.
- Step 4** Plug the other end of the second RS 232 cable into the RS 232 jack with the “in” icon underneath on the *2nd* Expansion Module.

Figure 4-6 Cable Connections with Two Expansion Modules



| | |
|----------|--|
| 1 | RS 232 cable connection to the RS 232 jack on the IP Phone |
| 2 | RS 232 cable connection to the RS 232 jack on Expansion Module 1 |
| 3 | 2nd RS 232 cable connection to the RS 232 jack on Expansion Module 1 |
| 4 | 2nd RS 232 cable connection to the RS 232 jack on Expansion Module 2 |

Connecting the Power Supply

To connect the power supply, follow these steps.

Procedure

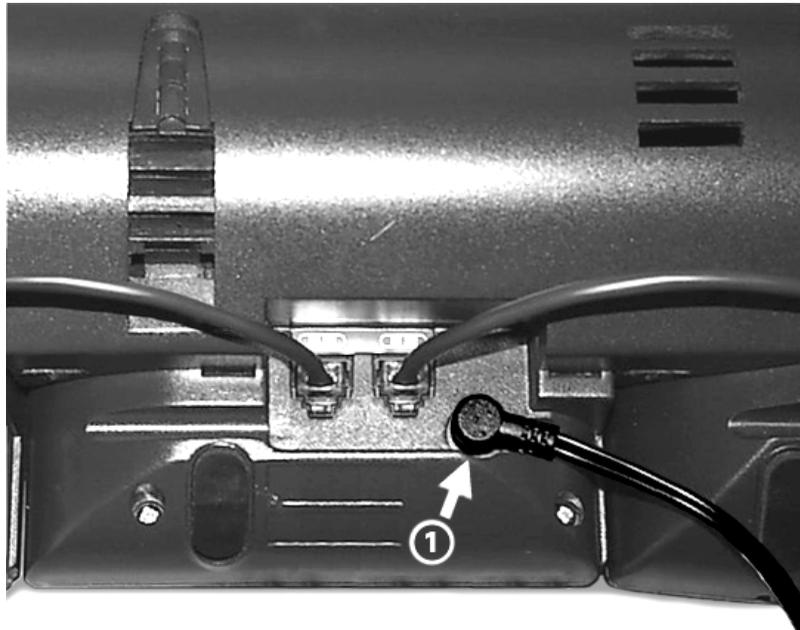
- Step 1** Depending on how your Cisco IP Phone 7960 is powered, perform one of the following actions:
- If your Cisco IP Phone 7960 is powered over the Ethernet and:
 - you have one Expansion Module, then connect the power supply unit to the AC adaptor port on the Expansion Module and plug the other end into a standard electrical power outlet in the wall.

or

 - you have two Expansion Modules, then connect the power supply unit to the AC adaptor port on the Expansion Module closest to the IP Phone and plug the other end into a standard electrical power outlet in the wall.
- If your Cisco IP Phone 7960 is powered with a power supply unit and:
 - you have one Expansion Module, then reconnect the original IP Phone power supply unit to the AC adaptor port on the IP Phone and plug the other end into a standard electrical power outlet in the wall.

or

- you have two Expansion Modules, then connect a second power supply unit to the AC adaptor port on the Expansion Module closest to the IP Phone and plug the other end into a standard electrical power outlet in the wall.
- Step 2** Reconnect the Cisco IP Phone 7960 handset and network connections.

Figure 4-7 Power Supply Connector Port

-
- | | |
|---|--|
| 1 | Power supply connector plugged in to the power supply port on the back of the Expansion Module |
|---|--|
-

Connecting the Footstand

To connect the footstand to the support bar, follow these steps.

Procedure

-
- | | |
|---------------|---|
| Step 1 | Locate the three hooks on the footstand. |
| Step 2 | Position the hooks so that they align with the two open slots on the support bar. |

**Note**

Note: There are four positions in each of the three sets of open slots on the support bar. This lets you choose the angle of the footstand.

Step 3

Insert the footstand hooks into the support bar and push in slightly to make the connection.

Figure 4-8 Part Connections on the Footstand and Support Bar



73668

| | |
|----------|---|
| 1 | Slots on the support bar |
| 2 | Hooks on the footstand |
| 3 | Insert and rotate footstand to connect to support bar |

Start Up Sequence

After the 7914 Expansion Module is installed, upon startup the lighted buttons are all steady red. Then the LCD screen refreshes and the lighted buttons are all off and any line appearances are displayed in the LCD screen. You can then start using the Expansion Module.



Configuring Network Settings on the Cisco IP Phone

Because the Cisco IP Phone is a network device, it includes many configurable network settings. You must configure many of these options before the phone is accessible and functional for your users.

The following sections provide details about configuring and verifying these network settings:

- [Accessing the Network Configuration Settings, page 5-2](#)
- [Verifying Network Settings, page 5-3](#)
- [Modifying DHCP Settings, page 5-9](#)
- [Configuring IP Settings, page 5-14](#)
- [Configuring VLAN Settings, page 5-20](#)
- [Configuring TFTP Options, page 5-21](#)
- [Configuring Ports, page 5-25](#)

Accessing the Network Configuration Settings

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.

The unlocked padlock icon, shown below, appears in the margins of this chapter to indicate procedures that require you to unlock settings before modifying them.

The padlock icon also appears in the Network Configuration area of the Cisco IP Phone LCD screen to indicate that settings are unlocked and accessible for modification.

When settings are inaccessible, you can see an image of a *locked* padlock on the LCD screen. After you make the necessary changes to the network configuration settings, be sure to lock the settings again to prevent users from modifying them.



Follow these steps to view the padlock icon and to modify network settings:

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press ****#**
- This step either locks or unlocks the options, depending on the previous state. Continue with Step 2 to view the padlock icon.
- Step 2** Press **settings**.
- Step 3** Use the Navigation button to select **Network Configuration**.
- Step 4** Press the **Select** soft key.
- Step 5** Look at the upper-right portion of your LCD.
- Locked—The icon displays a locked padlock.
 - Unlocked—The icon displays an unlocked padlock.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press ****#**
- This step either locks or unlocks the options, depending on the previous state. Continue with Step 2 to view the padlock icon.
- Step 2** Press **settings**.
- Step 3** Select **6** (Network Configuration).
- Step 4** Look at the upper-right portion of your LCD.
- Locked—The icon displays a locked padlock.
 - Unlocked—The icon displays an unlocked padlock.
-

Verifying Network Settings

The Cisco IP Phone displays detailed information about its current network settings. Use this information to troubleshoot or to make modifications.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use the Navigation button to select **Network Configuration**.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll through the options to display the settings described in [Table 5-1](#).
-

Cisco IP Phone 7910

Procedure

-
- Step 1** Press **settings**.
- Step 2** Press **3** (Network Configuration).
- Step 3** Scroll through the options to display the settings described in [Table 5-1](#).

If the Cisco IP Phone 7910 is locked, only the configured options in [Table 5-1](#) appear. When the phone is unlocked, all options display.

Table 5-1 Network Settings

| Network Setting | Description | Usage Notes |
|-----------------|---|--|
| DHCP Server | Displays IP address of the Dynamic Host Configuration Protocol (DHCP) server that the phone used to obtain IP address. | See the “Modifying DHCP Settings” section on page 5-9. |
| BootP Server | Indicates whether the phone obtained its IP configuration from a Bootstrap Protocol (BootP) server rather than a DHCP server. | <ul style="list-style-type: none"> • Displays Yes or No. • Cannot be configured. |
| MAC Address | Identifies the unique Media Access Control (MAC) address of the phone. | Cannot configure. |
| Host Name | Identifies the unique host name assigned to the phone. | Obtained from the DHCP server. |
| Domain Name | Identifies the name of the Domain Name System (DNS) domain in which the phone resides. | See the “Assigning Domain Name” section on page 5-18. |
| IP Address | Indicates the Internet Protocol (IP) address of the phone. | See the “Assigning an IP Address” section on page 5-14. |
| Subnet Mask | Indicates the subnet mask used by the phone. | See the “Assigning Subnet Mask” section on page 5-17. |

Table 5-1 Network Settings (continued)

| Network Setting | Description | Usage Notes |
|---------------------|--|---|
| TFTP Server 1 | Indicates the primary Trivial File Transfer Protocol (TFTP) server used by the phone to obtain configuration files. | See the “Assigning a TFTP Sever” section on page 5-21. |
| Default Routers 1-5 | Identifies the default gateway used by the phone. | See the “Assigning Default Router” section on page 5-15. |
| DNS Servers 1-5 | Indicates the Domain Name System (DNS) server used by the phone to resolve the host name of the TFTP server, Cisco CallManager system and web server host names. | See the “Assigning DNS Servers” section on page 5-19. |
| Operational VLAN | Indicates the 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, then the operational VLAN reflects the Administrative VLAN. If neither the auxiliary VLAN nor the Administrative VLAN are configured, then the Operational VLAN field is blank. | Obtained via Cisco Discovery Protocol (CDP) from the switch to which the phone is attached. |
| Administrative VLAN | Indicates the auxiliary VLAN in which the phone is a member. Used only if the phone does not receive an auxiliary VLAN from the switch. The Administrative VLAN is ignored if an auxiliary VLAN is obtained from the switch. | See the “Configuring VLAN Settings” section on page 5-20. |
| CallManager 1-5 | Identifies the Cisco CallManager systems that are available for processing calls from this phone. | Cannot configure locally. Use Cisco CallManager to modify. |

Table 5-1 Network Settings (continued)

| Network Setting | Description | Usage Notes |
|-----------------------|--|---|
| Information URL | Specifies the location (UL) of the help text for the information (?) button. | Available only on the Cisco IP Phone 7960/7940. Cannot configure locally. Use Cisco CallManager to modify. |
| Directories URL | Specifies the server from which the phone obtains directory information. | Available only on the Cisco IP Phone 7960/7940. Cannot configure locally. Use Cisco CallManager to modify. |
| Messages URL | Specifies the message services URL. | Available only on the Cisco IP Phone 7960/7940. Cannot configure locally. Use Cisco CallManager to modify. |
| Services URL | Specifies the location (URL) for Cisco IP Phone Services. | Available only on the Cisco IP Phone 7960/7940. Cannot configure locally. Use Cisco CallManager to modify. |
| DHCP Enabled | Indicates whether DHCP is being used by the phone. | See the “Modifying DHCP Settings” section on page 5-9. |
| DHCP Address Released | Allows the IP-address assigned by DHCP to be released. | See the “Releasing a DHCP Address” section on page 5-12. |
| Alternative TFTP | Indicates whether the phone is using an alternative TFTP server. | See the “Using an Alternate TFTP Server” section on page 5-23. |
| Erase configuration | Allows you to erase all locally-assigned settings on the phone and reset values to the default settings. | See the “Erasing Local Configuration” section on page 7-13. |

Table 5-1 Network Settings (continued)

| Network Setting | Description | Usage Notes |
|--------------------|--|--|
| Forwarding Delay | Indicates whether the internal switch begins forwarding packets between the PC port and switch (SW) port on your phone when your the PC port becomes active. | Displays Yes or No . When set to No , the internal switch begins forwarding packets immediately. When set to Yes , the internal switch waits 8 seconds before forwarding packets between the PC Port and the SW Port. Set the Forwarding Delay to Yes if you connect both ports to switches for redundant uplinks or daisy chain phones together. Cannot configure locally. Use Cisco CallManager to modify. |
| Idle URL | Specifies the URL that the phone displays when the phone has not been used for the time specified in Idle URL Timer setting. For example, your administrator can display a logo on the LCD when the phone has not been used for 5 minutes. | Available only on the Cisco IP Phone 7960/7940. Cannot configure locally. Use Cisco CallManager to modify. |
| Idle URL Time | Displays the amount of time (in seconds) that elapses before the URL specified in the Idle URL setting displays. | Available only on the Cisco IP Phone 7960/7940. Cannot configure locally. Use Cisco CallManager to modify. |
| Authentication URL | Displays the URL that the phone uses to validate requests made to the phone web server. | Available only on the Cisco IP Phone 7960/7940. Cannot configure locally. Use Cisco CallManager to modify. |
| Proxy Server URL | Specifies the host and port used to proxy HTTP requests for access to non-local host addresses from the phone HTTP client. | Available only on the Cisco IP Phone 7960/7940. Cannot configure locally. Use Cisco CallManager to modify. |

Table 5-1 Network Settings (continued)

| Network Setting | Description | Usage Notes |
|-----------------------|---|--|
| PC Port Disabled | Indicates whether the PC port on the phone is enabled or disabled. The port is labeled “10/100 PC” on the back of the phone and is used to connect a PC or workstation to the phone so that they can share a single network connection. | Cannot configure locally. Use Cisco CallManager to modify. |
| SW Port Configuration | Indicates the speed and duplex of the switch port. Valid values are: A (auto negotiate), 10H (10BASE-T/half duplex), 10F (10BASE-T /full duplex), 100H (100BASE-T /half duplex), or 100F (100BASE-T /full duplex). | This parameter is configured at the phone. See “Configuring the SW Port” section on page 5-26. |
| PC Port Configuration | Indicates the speed and duplex of the PC port. Valid values are: A (auto negotiate), 10H (10BASE-T /half duplex), 10F (10BASE-T /full duplex), 100H (100BASE-T/half duplex), or 100F (100BASE-T/full duplex). | This parameter is configured at the phone. See “Configuring the PC Port” section on page 5-27. |
| TFTP Server 2 | Displays the IP address of the backup TFTP server. This server is used to obtain configuration files and software upgrades if the primary TFTP server is unavailable. | See the “Assigning a Backup TFTP Server” section on page 5-24. |
| User Locale | Identifies the locale associated with the phone user. The user locale identifies a set of detailed information to support users, including language, font, date and time formatting, and alphanumeric keyboard text information. | Cannot configure locally. Use Cisco CallManager to modify. |

Table 5-1 Network Settings (continued)

| Network Setting | Description | Usage Notes |
|-------------------|---|--|
| Network Locale | Identifies the locale associate with the phone. The network locale identifies a set of detailed information to support the hardware in a specific location. The network locale contains a definition of the tones and cadences used by the phone in a specific geographic area. | Cannot configure locally. Use Cisco CallManager to modify. |
| Handset Only Mode | Indicates that the headset and speaker are disabled. | Informational only. See the “Configuring the Handset, Headset, and Speakerphone” section on page 2-8 for additional information. |

Modifying DHCP Settings

Dynamic Host Configuration Protocol (DHCP) automatically assigns IP addresses to devices when you connect them to the network. This section provides information about enabling DHCP and releasing a DHCP-assigned IP address in the following topics:

- [Enabling DHCP, page 5-10](#)
- [Disabling DHCP, page 5-11](#)
- [Releasing a DHCP Address, page 5-12](#)

Enabling DHCP



Cisco IP Phones enable DHCP by default, but you can reset the protocol if it becomes disabled.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
 - Step 2** Use the Navigation button to select **Network Configuration**.
 - Step 3** Press the **Select** soft key.
 - Step 4** Scroll to **DHCP Enabled**.
If DHCP is disabled, the option displays as
DHCP Enabled NO
 - Step 5** Press the **Yes** soft key to enable DHCP.
 - Step 6** Press **Save**.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
- Step 2** Press **3** (Network Configuration).
- Step 3** Use the down volume key to select **DHCP Enabled**.
If DHCP is disabled, the option displays as
DHCP Enabled
NO
- Step 4** Press * to edit.

Step 5 Use the **down** volume key to select **Yes**.

Step 6 Press **#** to save.

Disabling DHCP



If you do not use DHCP in your network, use this procedure to disable DHCP before manually assigning IP addresses to Cisco IP phones.



Note

Procedures involved in configuring IP settings or TFTP options cannot be completed when DHCP is enabled in your network.

Cisco IP Phone 7960/7940

Procedure

Step 1 Press **settings**.

Step 2 Use the Navigation button to select to **Network Configuration**.

Step 3 Press the **Select** soft key.

Step 4 Scroll to **DHCP Enabled**.

If DHCP is enabled, the option displays as

DHCP Enabled YES

Step 5 Press the **No** soft key to disable DHCP.

Step 6 Enter the IP settings as described in [“Configuring IP Settings” section on page 5-14](#).

Step 7 Press **Save**.

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
- Step 2** Press **6** (Network Configuration).
- Step 3** Use the **down** volume key to select **DHCP Enabled**.
If DHCP is enabled, the option displays as
DHCP Enabled
YES
- Step 4** Press ***** to edit.
- Step 5** Use the **down** volume key to select **No**.
- Step 6** Press **#** to save.
-

Releasing a DHCP Address



When moving the phone to a new network segment, you should first release the DHCP address.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use the Navigation button to select **Network Configuration**.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll to **DHCP Address Released**.
If the DHCP address is currently assigned, the option displays as
DHCP Address Released No

Step 5 Press the **Yes** soft key to release the DHCP-assigned IP address.

Step 6 Press **Save**.

The phone remains in an idle state, without an IP address assigned, until you do one of the following actions:

- Manually assign an IP address
 - Set DHCP Address Released back to **No**.
 - Power cycle the phone, which enables all default settings, including enabling DHCP.
-

Cisco IP Phone 7910

Procedure

Step 1 Press **settings**.

Step 2 Press **6** (Network Configuration).

Step 3 Use the **down** volume key to select **DHCP Address Released**.

If the DHCP address is currently assigned, the option displays as

```
DHCP Address Released  
NO
```

Step 4 Press * to edit.

Step 5 Use the **down** volume key to select **Yes**.

Step 6 Press # to save.

The phone remains in an idle state, without an IP address assigned, until you do one of the following actions:

- Manually assign an IP address.
 - Set DHCP Address Released back to **No**.
 - Power cycle the phone, which enables all default settings, including enabling DHCP.
-

Configuring IP Settings

Use these guidelines when manually configuring the IP settings:

- You can use 0.0.0.0 for the subnet mask only if the default gateway is also 0.0.0.0.
- Ensure TFTP server has an IP address.
- Ensure the default gateway IP address is on the same subnet as the host IP address.

**Note**

Procedures involved in configuring IP settings or TFTP options cannot be completed when DHCP is enabled in your network.

This section covers the following topics:

- [Assigning an IP Address, page 5-14](#)
- [Assigning Default Router, page 5-15](#)
- [Assigning Subnet Mask, page 5-17](#)
- [Assigning Domain Name, page 5-18](#)
- [Assigning DNS Servers, page 5-19](#)

Assigning an IP Address



The IP address is the unique logical address identifying each host computer, or node, on a TCP/IP network. An IP address is a 32-bit number expressed as four decimal numbers from 0 to 255 separated by periods.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use the Navigation button to select **Network Configuration**.
- Step 3** Press the **Select** soft key.

- Step 4** Scroll to **IP Address**.
 - Step 5** Press the **Edit** soft key.
 - Step 6** Use the buttons on the dial pad to enter a new IP address, using the * key on the dial pad or the . soft key to enter periods.
 - Step 7** Use the << soft key to correct any mistakes.
 - Step 8** Press the **Validate** soft key.
 - Step 9** Press **Save**.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
 - Step 2** Press **6** (Network Configuration).
 - Step 3** Use the **down** volume key to select **IP Address**.
 - Step 4** Press * to edit.
 - Step 5** Use the buttons on the dial pad to enter a new IP address, using the **down** arrow to back space and the * key on the dial pad to enter periods.
 - Step 6** Press # to save.
-

Assigning Default Router



If you manually assign an IP address to the Cisco IP Phone, you must indicate the default router to be used. The default router provides connectivity to the IP network beyond the subnet to which the phone belongs.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
 - Step 2** Use the Navigation button to select **Network Configuration**.
 - Step 3** Press the **Select** soft key.
 - Step 4** Scroll to **Default Router 1**.
 - Step 5** Press the **Edit** soft key.
 - Step 6** Use the buttons on the dial pad to enter the new router IP address, using the * key on the dial pad or the . soft key to enter periods.
 - Step 7** Use the << soft key to correct any mistakes.
 - Step 8** Press the **Validate** soft key.
 - Step 9** Scroll to **Default Router 2-5** to add backup gateways.
 - Step 10** Press **Save**.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
 - Step 2** Press **6** (Network Configuration).
 - Step 3** Use the **down** volume key to select **Default Router 1**.
 - Step 4** Press * to edit.
 - Step 5** Use the buttons on the dial pad to enter the new router IP address, using the **down** arrow to backspace and the * key on the dial pad to enter periods.
 - Step 6** Scroll to **Default Router 2-5** to add backup gateways.
 - Step 7** Press # to **Save**.
-

Assigning Subnet Mask



The subnet mask is used to partition the IP address into a network and a host identifier. The subnet mask is used to mask a portion of the IP address so that TCP/IP can distinguish the network ID from the host ID.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
 - Step 2** Use the Navigation button to select **Network Configuration**.
 - Step 3** Press the **Select** soft key.
 - Step 4** Scroll to **Subnet Mask**.
 - Step 5** Press the **Edit** soft key.
 - Step 6** Use the buttons on the dial pad to enter the new subnet mask, using the * key on the dial pad or the . soft key to enter periods.
 - Step 7** Use the << soft key to correct any mistakes.
 - Step 8** Press the **Validate** soft key.
 - Step 9** Press the **Save** soft key to save this change.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
- Step 2** Press **6** (Network Configuration).
- Step 3** Use the **down** volume key to select **Subnet Mask**.
- Step 4** Press * to edit.

- Step 5** Use the buttons on the dial pad to enter the new subnet mask, using the **down** arrow to back space and the * key on the dial pad to enter periods.
- Step 6** Press # to save.
-

Assigning Domain Name



The domain name is the name of the Domain Name System (DNS) domain in which the phone is located. DNS is a hierarchical name for TCP/IP host computers that provides standard naming conventions.

Before assigning a domain name, verify that you have a DNS in your network.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use the Navigation button to select **Network Configuration**.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll to **Domain Name**.
- Step 5** Press the **Edit** soft key.
- Step 6** Use the buttons on the dial pad to enter a new domain name, using the **0** key on the dial pad to enter periods.
- To enter letters, use the numbers associated with a particular letter. For example, the **2** key has the letters ABC. For a lower case “a,” press **2** once. Press the **2** key repeatedly to scroll through the available letters and numbers. Pause after the selected letter appears on the screen.
- Step 7** Use the << soft key to correct any mistakes.
- Step 8** Press the **Validate** soft key.
- Step 9** Press the **Save** soft key to save this change.
-

Cisco IP Phone 7910

Changing the domain name on the Cisco IP Phone 7910 is not currently supported.

Assigning DNS Servers



The DNS setting on the Cisco IP Phone allows users to specify remote computers by host names, which are character strings with some mnemonic value, rather than by using IP addresses, which are simply strings of numbers.

The phones use DNS to resolve the host name of TFTP servers, Cisco CallManager systems, and web server host names when the system is configured to use names rather than IP addresses.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
 - Step 2** Use the Navigation button to select **Network Configuration**.
 - Step 3** Press the **Select** soft key.
 - Step 4** Scroll to **DNS Server 1**.
 - Step 5** Press the **Edit** soft key.
 - Step 6** Use the buttons on the dial pad to enter a new DNS server address, using the * key on the dial pad or the . soft key to enter periods.
 - Step 7** Use the << soft key to correct any mistakes.
 - Step 8** Press the **Validate** soft key.
 - Step 9** Scroll to **DNS Server 2-5** to add backup DNS server.
 - Step 10** Press **Save**.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
 - Step 2** Press **6** (Network Configuration).
 - Step 3** Use the **down** volume key to select **DNS server 1**.
 - Step 4** Press ***** to edit.
 - Step 5** Use the buttons on the dial pad to enter the new DNS server address, using the **down** arrow to back space and the ***** key on the dial pad to enter periods.
 - Step 6** Press **#** to save.
-

Configuring VLAN Settings



You can change the administrative VLAN used by the Cisco IP Phone. However, if you have an auxiliary VLAN assigned on the Cisco Catalyst switch, that setting overrides any changes made on the phone.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use Navigation button to select **Network Configuration**.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll to **Admin. VLAN Id**.
- Step 5** Press the **Edit** soft key.
- Step 6** Use the buttons on the dial pad to enter the new Admin VLAN setting.
- Step 7** Use the **<<** soft key to correct any mistakes.

Step 8 Press **Validate**.

Step 9 Press **Save**.

Cisco IP Phone 7910

Procedure

Step 1 Press **settings**.

Step 2 Press **6** (Network Configuration).

Step 3 Use the **down** volume key to select **Admin VLAN ID** setting.

Step 4 Press ***** to edit.

Step 5 Use the buttons on the dial pad to enter the new Admin VLAN ID, using the **down** arrow to backspace.

Step 6 Press **#** to save.

Configuring TFTP Options

If you do not use DHCP to direct the Cisco IP Phone 7960 to a TFTP server, you must manually assign one. You can also assign an alternative TFTP server to use instead of the one assigned by DHCP.

This section covers these topics:

- [Assigning a TFTP Sever, page 5-21](#)
- [Using an Alternate TFTP Server, page 5-23](#)

Assigning a TFTP Sever



The default TFTP server is set to CiscoCM1. If you are not using DHCP in your network, and you want to change this setting, you must manually assign the TFTP server to the phone.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
 - Step 2** Use the Navigation button to select **Network Configuration**.
 - Step 3** Press the **Select** soft key.
 - Step 4** Scroll to **TFTP Server 1**.
 - Step 5** Press the **Edit** soft key.
 - Step 6** Use the buttons on the dial pad to enter a new TFTP server address, using the * key on the dial pad or the . soft key to enter periods.
 - Step 7** Use the << soft key to correct any mistakes.
 - Step 8** Press **Validate**.
 - Step 9** Press **Save**.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
 - Step 2** Press **6** (Network Configuration).
 - Step 3** Use the **down** volume key to select **TFTP Server 1** setting.
 - Step 4** Press * to edit.
 - Step 5** Use the buttons on the dial pad to enter the new TFTP server address, using the **down** arrow to back space and the * key on the dial pad to enter periods.
 - Step 6** Press # to save.
-

Using an Alternate TFTP Server



If you are using DHCP, but you want to override the TFTP address that the phone received through DHCP, enable an alternate TFTP Server.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
 - Step 2** Use the Navigation button to select **Network Configuration**.
 - Step 3** Press the **Select** soft key.
 - Step 4** Scroll to **Alternate TFTP Server**.
If the phone is not using an alternative TFTP server, the option displays as
`Alternate TFTP NO`
 - Step 5** Press the **Yes** soft key.
 - Step 6** Scroll to TFTP Server
 - Step 7** Press the **Edit** soft key.
 - Step 8** Use the buttons on the dial pad to enter the new Alternative TFTP Server address, using the * key on the dial pad or the . soft key to enter periods.
 - Step 9** Press the **Yes** soft key to enable an alternative TFTP server.
 - Step 10** Press **Validate**.
 - Step 11** Press **Save**.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
- Step 2** Press **6** (Network Configuration).
- Step 3** Use the **down** volume key to select **Alternate TFTP** setting.

If an alternate TFTP server is currently unassigned, the option displays as:

```
Alternate TFTP  
NO
```

- Step 4** Press * to edit.
 - Step 5** Use the **down** volume key to select **Yes**.
 - Step 6** Press # to save.
 - Step 7** Use the **down** volume key to select **TFTP Server** setting.
 - Step 8** Press * to edit.
 - Step 9** Use the buttons on the dial pad to enter the new TFTP server address, using the **down** arrow to back space and the * key on the dial pad to enter periods.
 - Step 10** Press # to save.
-

Assigning a Backup TFTP Server

TFTP Server 2 displays the IP address of the backup TFTP server. This server is used to obtain configuration files and software upgrades if the primary TFTP server is unavailable.

Before You Begin

To assign a backup TFTP server, the **Alternate TFTP** setting must be set to **Yes** and **TFTP Server 1** setting must contain a value.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use the Navigation button to select **Network Configuration**.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll to **TFTP Server 2**.
- Step 5** Press the **Edit** soft key.

- Step 6** Use the buttons on the dial pad to enter a backup TFTP server address, using the * key on the dial pad or the . soft key to enter periods.
 - Step 7** Use the << soft key to correct any mistakes.
 - Step 8** Press **Validate**.
 - Step 9** Press **Save**.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
 - Step 2** Press **6** (Network Configuration).
 - Step 3** Use the **down** volume key to select **TFTP Server 2** setting.
 - Step 4** Press * to edit.
 - Step 5** Use the buttons on the dial pad to enter the backup TFTP server address, using the **down** arrow to back space and the * key on the dial pad to enter periods.
 - Step 6** Press # to save.
-

Configuring Ports

The PC and switch (SW) port configuration settings determine the speed and duplex of the PC and network ports, respectively.

If you change the port configuration setting value for either the PC port or the SW port, you must change the other to match or configure both to auto-negotiate.

If the phone is connected to a switch, you must configure the switch's port to the same speed/duplex as the phone, or configure both to auto-negotiate.

The values for both are: A (auto-negotiate), 10H (10BaseT/Half Duplex), 10F (10BaseT/Full Duplex), 100H (100BaseT/Half Duplex), or 100F (100BaseT/Full Duplex). This setting is not case sensitive.

This section covers the following topics:

- [Configuring the SW Port, page 5-26](#)
- [Configuring the PC Port, page 5-27](#)

Configuring the SW Port

Follow these procedures to set the speed of the switch port on the Cisco IP Phone.

Cisco IP Phone 7960/7940



Procedure

- Step 1** Press the **Settings** button.
- Step 2** Use the **Navigation** button to select Network Configuration.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll to SW Port Configuration.
- Step 5** Press the **Edit** soft key.
- Step 6** Use the buttons on the dial pad to enter the selected option.

To enter letters, use the numbers associated with a particular letter. For example, the 2 key has the letters ABC. For a lower case “a,” press **2** once. Press the **2** key repeatedly to scroll through the available letters and numbers. Pause after the selected letter appears on the screen.

Valid values are as follows:

- A (auto negotiate)
 - 10H (10basedT/half duplex)
 - 10F (10basedT/full duplex)
 - 100H (100basedT/half duplex)
 - 100F (100basedT/full duplex)
- Step 7** Use the << soft key to correct any mistakes.

- Step 8** Press the **Validate** soft key.
 - Step 9** Press the **Save** soft key to save this change.
-

Cisco IP Phone 7910



Procedure

- Step 1** Press the **Settings** button.
 - Step 2** Press **6** to select Network Configuration.
 - Step 3** Scroll (using the volume up/down keys) to SW Port Configuration.
 - Step 4** Press ***** to enter edit mode.
 - Step 5** Press the **volume down** button to scroll down through options.
Options are AUTO, 10HALF, 10FULL, 100HALF, and 100FULL.
 - Step 6** Select an option, then press the **volume up** button to exit this menu.
 - Step 7** Press **#** to save this change.
-

Configuring the PC Port

Follow these procedures to set the speed of the PC port on the Cisco IP Phone.

Cisco IP Phone 7960/7940



Procedure

- Step 1** Press the **Settings** button.
- Step 2** Use the **Navigation** button to select Network Configuration.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll to PC Port Configuration.
- Step 5** Press the **Edit** soft key.

- Step 6** Use the buttons on the dial pad to enter the selected option.
- To enter letters, use the numbers associated with a particular letter. For example, the 2 key has the letters ABC. For a lower case “a,” press **2** once. Press the **2** key repeatedly to scroll through the available letters and numbers. Pause after the selected letter appears on the screen.
- Valid values are as follows:
- A (auto negotiate)
 - 10H (10basedT/half duplex)
 - 10F (10basedT/full duplex)
 - 100H (100basedT/half duplex)
 - 100F (100basedT/full duplex)
- Step 7** Use the << soft key to correct any mistakes.
- Step 8** Press the **Validate** soft key.
- Step 9** Press the **Save** soft key to save this change.
-

Cisco IP Phone 7910



Procedure

- Step 1** Press the **Settings** button.
- Step 2** Press **6** to select Network Configuration.
- Step 3** Scroll (using the volume up/down keys) to PC Port Configuration.
- Step 4** Press * to enter edit mode.
- Step 5** Press the **volume down** button to scroll down through options.
- Options are AUTO, 10HALF, 10FULL, 100HALF, and 100FULL.
- Step 6** Select an option, then press the **volume up** button to exit this menu.
- Step 7** Press # to save this change.
-



Configuring Cisco IP Phones, Users, and Features in Cisco CallManager

After you install Cisco IP Phones in your network, configure their network settings, and add them to Cisco CallManager, you must then use Cisco CallManager to configure directory numbers, assign users, and configure features.

Many of the Cisco IP Phone features available to end users require that you configure them using the Cisco CallManager Administration application. An overview of configuration procedures is provided in this chapter; detailed instructions are available in Cisco CallManager Administration documentation.

This chapter describes setting up user features and providing users with information about those features. Refer to the following topics:

- [Configuring Cisco IP Phones in Cisco CallManager, page 6-2](#)
- [Adding Users to Cisco CallManager, page 6-5](#)
- [Modifying Phone Button Templates, page 6-5](#)
- [Configuring Corporate Directories, page 6-8](#)
- [Setting Up User Services, page 6-8](#)
- [Providing Information to End Users, page 6-9](#)

Configuring Cisco IP Phones in Cisco CallManager

After you add Cisco IP Phones to Cisco CallManager, you can add additional functionality to them.

[Table 6-1](#) includes a list of the supported telephony features and tips about how to configure them using Cisco CallManager. For additional details, refer to the *Cisco CallManager Administration Guide*, the *Cisco CallManager System Guide*, *Cisco CallManager Extended Services Administrator's Guide* or context-sensitive help in the application.

Table 6-1 Configuring Telephony Features Using Cisco CallManager

| Feature | Description | Configuration Tips |
|--------------|---|--|
| Auto answer | Forces the speakerphone or headset to go off hook automatically when an incoming call is received | From Cisco CallManager, choose: Device > Phone and select the directory number to configure. Using Cisco CallManager, you can enable this feature for either the headset or speakerphone. |
| Barge | Allows user to initiate joining an in-progress call on a shared line. | From Cisco CallManager, choose: Service > System Parameters and enable the BargeEnabled service parameter. |
| Call park | Places the call on hold so anyone connected to the Cisco CallManager system can retrieve it | From Cisco CallManager, choose: Feature > Call Park to configure. |
| Call pickup | Picks up incoming calls within a group | From Cisco CallManager, choose: Feature > Call Pickup to configure. From Cisco CallManager, choose: Device > Phone and select the directory number to assign a call pickup group. |
| Call waiting | Receives a second incoming call on the same line without disconnecting the first call | From Cisco CallManager, choose: Device > Phone and select the directory number to configure. |

Table 6-1 *Configuring Telephony Features Using Cisco CallManager (continued)*

| Feature | Description | Configuration Tips |
|--------------------|---|--|
| Caller ID | Displays number and name of caller | From Cisco CallManager, choose: Device > Phone to select outgoing caller ID pattern and to select whether to transmit or block caller ID information. |
| Conference | Initiates an ad hoc conference and then conference in other participants one at a time. | From Cisco CallManager, choose: Service > Media Resource > Conference Bridge to configure device to support conferences. |
| Extension Mobility | Enables users to sign into their directory number from any Cisco IP Phone | From Cisco CallManager, choose: Device > Phone . |
| Forward | Forwards all calls to the designated directory number | From Cisco CallManager, choose: Device > Phone and select the directory number to configure. You can configure Forward All, Forward Busy, or Forward No Answer. Users can also designate the forward numbers in the Cisco IP Phone Configuration windows. |
| Group call pickup | Allows users to pick up incoming calls within their own group or in other groups | From Cisco CallManager, choose: Feature > Call Pickup to configure. From Cisco CallManager, choose: Device > Phone and select the directory number to assign a call pickup group. |
| Hold | Places an active call on hold | This feature requires no configuration to work, unless you want to use music on hold. |
| Meet-Me conference | Enables other callers to join in a conference | From Cisco CallManager, choose: Service > Conference Bridge to configure Meet-Me parameters. |

Table 6-1 Configuring Telephony Features Using Cisco CallManager (continued)

| Feature | Description | Configuration Tips |
|-----------------|---|--|
| Message waiting | Users press this button to connect to the voice-messaging system. | From Cisco CallManager, choose: Device > Phone and select the directory number to select the type of message waiting indicator. |
| Music-on-hold | Plays music while callers are on hold | From Cisco CallManager, choose: Device > Phone to select audio sources and media resource. From Cisco CallManager, choose Service > Media Resource > Music On Hold to configure music on hold. |
| Redial | Redials the last number dialed on the Cisco IP phone | This feature requires no configuration to work. |
| Speed-dial | Rapidly dials a specified number that has been previously stored | From Cisco CallManager, choose: Device > Phone and click the Update Speed Dial buttons link at the top of the window. Users can designate speed-dial numbers using the Cisco IP Phone Configuration windows. |
| Transfer | Transfers an active call to another directory number | This feature requires no configuration to work. |
| Voice mail | Enables callers to leave messages if calls are unanswered | From Cisco CallManager, choose: Feature > Voice Mail > Cisco Voice Mail Port Wizard and Feature > Voice Mail > Cisco Voice Mail Port to configure Cisco voice mail. From Cisco CallManager, choose: Device > Phone and select the voice mail profile. |

Adding Users to Cisco CallManager

Cisco CallManager Administration allows you to display and maintain information about users on the network.

You must configure features to allow users to perform the following actions:

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

To set up these features, you must first add users to Cisco CallManager. Choose either of the following methods:

- To add users individually, use the Cisco CallManager Administration application and select **User > Add a New User**.

Refer to the *Cisco CallManager Administration Guide*, the *Cisco CallManager System Guide*, or context-sensitive help in the application for details.

- 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 the *Bulk Administration Tool User Guide* for details.

Modifying Phone Button Templates

Although the Cisco IP Phones support similar features, each phone model can implement these features differently. Modify phone button templates to assign features to phone buttons and to customize features for a phone model.

Ideally, you can modify templates before registering phones on the network. Proceeding in this order allows you to access customized phone button template options from the Cisco CallManager Administration application during registration.

To modify a phone button template, open the Cisco CallManager Administration application and select **Device > Phone Button Template**. Refer to the *Cisco CallManager Administration Guide*, the *Cisco CallManager System Guide*, or context-sensitive help in the application for details.

Possible Phone Button Template Configurations

The number of buttons and features that you can customize varies based upon Cisco IP Phone model. Familiarize yourself with the possible configuration options as described in [Table 6-2](#).

Table 6-2 *Default Phone Button Templates Listed by Model*

| Cisco IP Phone Model | Default Phone Button Template Description |
|----------------------|--|
| Cisco IP Phone 7960 | <p>The default Cisco IP Phone 7960 template uses buttons 1 and 2 for lines and assigns buttons 3 through 6 as speed dial. Access other phone features, such as call park, call forward, redial, hold, resume, voice mail, conferencing, and so on using soft keys on the Cisco IP Phone 7960.</p> |
| Cisco IP Phone 7940 | <p>The Cisco IP Phone 7940 comes with two preconfigured phone button templates provided:</p> <ul style="list-style-type: none"> • 7940 (2-Line)—Uses button 1 and 2 for lines. • 7940 (1-Line)—Uses button 1 for line 1 and button 2 for speed dial. <p>All Cisco IP Phone 7940 phones use one of these templates.</p> <p>Access phone features, such as call park, call forward, redial, hold, resume, voice mail, conferencing, and so on, using soft keys on the Cisco IP Phone 7940.</p> |

Table 6-2 *Default Phone Button Templates Listed by Model (continued)*

| Cisco IP Phone Model | Default Phone Button Template Description |
|--------------------------------------|--|
| Cisco IP Phone 7914 Expansion Module | <p>The default Cisco IP Phone 7914 Expansion Module template uses buttons 1 through 11 for speed dial and leaves buttons 12 through 14 undefined.</p> <p>Access phone features, such as call park, call forward, redial, hold, resume, voice mail, conferencing, and so on, using soft keys on the Cisco IP Phone 7960.</p> <p>Each Cisco IP Phone 7914 Expansion Module can use a different template.</p> |
| Cisco IP Phone 7910 | <p>The default phone button template for the Cisco IP Phone 7910 (named Default 7910) uses button 1 for message waiting, button 2 for conference, button 3 for forwarding, buttons 4 and 5 for speed dial, and button 6 for redial.</p> <p>The Cisco IP Phone 7910 has fixed buttons for Line, Hold, Transfer, and Settings.</p> |

Updating Button Labels

If you change the button assignments on the Cisco IP Phone 7910, you can also update their corresponding labels. The Cisco IP Phone 7910 ships with extra mylar labels on a perforated sheet. After printing the labels, you can easily remove them from this sheet. These label sheets have different textures—one smooth side and one textured side; the textured side is labeled “front.” This is the side that users contact when pressing the buttons. The type of printing method used determines the side to print on. To avoid ink rubbing off on users’ fingers, choose a printing method that prints on the smooth side of the labels.

Use these specifications to print on the labels:

- Text size—10 point (on a PC-compatible computer) or 12 point (on a Macintosh-compatible computer)
- Text font—Univers 65 bold oblique
- Text color—PMS 413C
- Text position—2.533 mm above the button hole openings

Configuring Corporate Directories

Cisco IP Phone models 7960 and 7940 can store a directory of employee names and phone numbers. Although you access the directory from the IP Phone, you must configure the directory before users can access it. To use the corporate directory, you must have users entered into a Lightweight Directory Access Protocol (LDAP) directory configured with Cisco CallManager.

To set up these features, open Cisco CallManager and select **User > Global Directory**. Refer to the *Cisco CallManager Administration Guide*, the *Cisco CallManager System Guide*, or context-sensitive help in the Cisco CallManager Administration application for details.

Setting Up User Services

The Cisco IP Phone models 7960 and 7940 allow users to access specific information services, such as local movie times, stock quotes, weather reports, and so on. Although users access these services by pressing the Services button to display a services menu on the Cisco IP Phone, you must first configure the services to which users can subscribe.

In summary:

- System administrators configure available services using the Cisco CallManager Administration application.
- Users subscribe to services using the Cisco IP Phone User Options application. This web-based application provides a graphic user interface (GUI) for limited, end-user configuration of IP Phone applications.

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

To set up these features, open the Cisco CallManager Administration application and select **Feature > Cisco IP Phone Services**. Refer to the *Cisco CallManager Administration Guide*, the *Cisco CallManager System Guide*, or context-sensitive help in the Cisco CallManager Administration application for details.

After you configure these services, verify that your users have access to the Cisco CallManager IP Phone Options web-based application, where they can select and subscribe to configured services. Refer to the *Cisco CallManager Administration Guide*, the *Cisco CallManager System Guide*, or context-sensitive help in the Cisco CallManager Administration application for details.

**Note**

To configure Extension Mobility services for users, see the *Cisco CallManager Extended Services Administrator's Guide*.

Providing Information to End Users

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

Provide the following information to end users:

- Identify yourself. The *Cisco IP Phone Models 7960 and 7940 User Guide* instructs users to direct some questions to a system administrator. To assist users, consider distributing an E-mail or memo identifying yourself or your network team. Provide contact information.
- Provide end users with the following information about the Cisco IP Phone User Options web-based application:
 - The URL required to access the application
`http://<serverName>/CCMUser/`, where `<serverName>` is the host on which the web server is installed.
 - A user ID and default password needed to access the application
These settings correspond to the values you entered when you added the user to Cisco CallManager.
 - A brief description of what a web-based, graphic user interface application is, and how it is accessed with a Web browser.
 - Outline the tasks that users can expect to accomplish with the application, including subscribing to services, setting up speed dial and call forwarding numbers, and creating a personal address book.

- Provide end users with access to user documentation for the Cisco IP Phones. For example, the *Cisco IP Phone Models 7960 and 7940 User Guide* includes detailed user instructions for subscribing to services, using extension mobility, and other key features.

For a list of available documentation, go to the Cisco IP Phone website at: http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/index.htm and select your preferred language.

For more information about viewing or ordering documentation, see the “[Obtaining Documentation](#)” section on page xii.



Troubleshooting the Cisco IP Phone

Cisco IP Phones include diagnostic screens that enable you to collect information that can assist you in troubleshooting problems in your IP telephony network.

These sections provide details about these tools and how to use them:

- [Obtaining Status, Model, and Version Information, page 7-1](#)
- [Resetting the Cisco IP Phone, page 7-12](#)
- [Erasing Local Configuration, page 7-13](#)
- [Updating Firmware Version, page 7-14](#)
- [Resolving Startup Problems, page 7-15](#)
- [Resolving Known Issues, page 7-25](#)

Obtaining Status, Model, and Version Information

On Cisco IP Phones, you can obtain status information about the current call and the network, and verify the phone model and installed firmware version.

This section covers these topics:

- [Displaying Statistics for Current Call, page 7-2](#)
- [Viewing Status Messages, page 7-3](#)
- [Displaying Network Statistics, page 7-8](#)
- [Verifying Model and Serial Number, page 7-10](#)
- [Verifying Firmware Version, page 7-11](#)

Displaying Statistics for Current Call

If you experience problems during an active call, you can collect information during that call. This information provides useful troubleshooting information that might assist you in resolving these problems and preventing them from occurring during future calls.

Cisco IP Phone 7960/7940

During the call, press the ? button twice rapidly. The following information displays:

- RxType—Type of voice stream received (RTP streaming audio) (G.729, G.711 u-law, G.711 A-law, or Link16k).
- RxSize—Size of voice packets (in milliseconds) in the receiving voice stream (RTP streaming audio).
- RxCnt—Number of RTP voice packets received since voice stream was opened (which is not necessarily identical to those received since the call began because the call might have been placed on hold).
- TxType—Type of voice stream transmitted (RTP streaming audio) (G.729, G.711 u-law, G.711 A-law, or Link16k).
- TxSize—Size of voice packets (in milliseconds) in the transmitting voice stream.
- TxCnt—Number of RTP voice packets transmitted since voice stream was opened (which is not necessarily identical to those received since the call began because the call might have been placed on hold).
- Avg Jtr—Estimated average RTP packet jitter (dynamic delay a packet encounters when going through the network) observed since the receiving voice stream was opened.
- Max Jtr—Maximum jitter observed since the receiving voice stream was opened.
- RxDisc—Number of RTP packets in the receiving voice stream that have been discarded (bad packets, too late, and so on).
- RxLost—Missing RTP packets (lost in transit).

Troubleshooting Tips

- The RxType/TxType indicates which codec is being used for the call between this phone and the other device. If they do not match, verify that the other device supports the codec conversation or that a transcoder is in place to support the service.
- The size of the sound samples (RxSize/TxSize) should match on both devices.
- If you are experiencing gaps in your voice calls, check the AvgJtr and MaxJtr values. A large variance between the two values might indicate a problem with jitter on the network or periodic high rate of network activity.

For additional information, see the *Using the 79xx Status Information For Troubleshooting* tech note available from Cisco.com:

http://www.cisco.com/warp/customer/788/AVVID/telecaster_trouble.html

Viewing Status Messages

Use the status messages to diagnose network configuration problems. You can access these messages at any point, even if the phone has not completed its startup process.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
 - Step 2** Use the Navigation button to select **Status**.
 - Step 3** Press the **Select** soft key.
 - Step 4** Select **Status Messages**.
 - Step 5** Press the **Select** soft key.
 - Step 6** The status messages screen might display any of the messages described in [Table 7-1](#).
-

Table 7-1 Status Messages

| Message | Explanation | Possible Explanation and Action |
|---------------------|--|---|
| BootP server used | The phone obtained its IP address from a BootP server rather than a DHCP server. | None. This message is informational only. |
| CFG file not found | The name-based and default configuration file was not found on the TFTP Server. | <p>The configuration file for a particular phone is created when the phone is added to the Cisco CallManager database. If the phone has not been added to the Cisco CallManager database, the TFTP server generates a CFG File Not Found response.</p> <ul style="list-style-type: none"> • Phone is not registered with Cisco CallManager. You must manually add the phone to Cisco CallManager if you are not allowing phones to auto-register. See the “Adding Phones Manually” section on page 2-12 for details. • If you are using DHCP, verify that the DHCP server is pointing to the correct TFTP server. • If you are using static IP addresses, check configuration of the TFTP server. Refer to the “Configuring TFTP Options” section on page 5-21 for details on assigning a TFTP server. |
| CFG TFTP Size Error | The configuration file is too large for file system on the phone. | Power cycle the phone. |
| Checksum Error | Downloaded software file is corrupted. | Obtain a new copy of the phone firmware and place it in the TFTPPath directory. You should only copy files into this directory when the TFTP server software is shut down, otherwise the files may be corrupted. |

Table 7-1 Status Messages (continued)

| Message | Explanation | Possible Explanation and Action |
|------------------|---|---|
| DHCP timeout | DHCP server did not respond. | <ul style="list-style-type: none"> • Network is busy—the errors should resolve themselves when the network load reduces. • No network connectivity between the DHCP server and the phone—verify the network connections. • DHCP server is down—check configuration of DHCP server. • Errors persist—consider assigning a static IP address. Refer to the “Configuring IP Settings” section on page 5-14 for details on assigning a static IP address. |
| DNS timeout | DNS server did not respond. | <ul style="list-style-type: none"> • Network is busy—the errors should resolve themselves when the network load reduces. • No network connectivity between the DNS server and the phone—verify the network connections. • DNS server is down—check configuration of DNS server. |
| DNS unknown host | DNS could not resolve the name of the TFTP server or Cisco CallManager. | <ul style="list-style-type: none"> • Verify the host names of the TFTP server or Cisco CallManager are configured properly in DNS. • Consider using IP addresses rather than host names. |
| Duplicate IP | Another device is using the IP address assigned to the phone. | <ul style="list-style-type: none"> • If the phone has a static IP address, verify that you have not assigned a duplicate IP address. Refer to the “Assigning an IP Address” section on page 5-14 section for details • If you are using DHCP, check the DHCP server configuration. |

Table 7-1 Status Messages (continued)

| Message | Explanation | Possible Explanation and Action |
|---------------------|--|---|
| Error update locale | One or more localization files could not be found in the TFTPPath directory or were not valid. The locale was not changed. | <p>Check that the following files are located within subdirectories in the TFTPPath directory:</p> <ul style="list-style-type: none"> • Located in subdirectory with same name as network locale: <ul style="list-style-type: none"> – tones.xml • Located in subdirectory with same name as user locale: <ul style="list-style-type: none"> – glyphs.xml – dictionary.xml – kate.xml – dictionary.xml |
| IP address released | The phone has been configured to release its IP address. | The phone remains idle until it is power cycled or you reset the DHCP address. Refer to the “Modifying DHCP Settings” section on page 5-9 section for details. |
| Load ID incorrect | Load ID of the software file is of the wrong type. | Check the load ID assigned to the phone (Cisco CallManager > Device > Phone). Verify that the load ID is entered correctly. |
| Load rejected HC | The application that was downloaded is not compatible with the phone’s hardware. | <p>This error only occurs if you were attempting to install a version of software on this phone that did not support hardware changes on this newer phone.</p> <p>Check the load ID assigned to the phone (Cisco CallManager > Device > Phone). Re-enter the load displayed on the phone (see the “Verifying Firmware Version” section on page 7-11 to verify the phone setting).</p> |

Table 7-1 Status Messages (continued)

| Message | Explanation | Possible Explanation and Action |
|-------------------------------------|--|--|
| No default router | DHCP or static configuration did not specify a default router. | <ul style="list-style-type: none"> If the phone has a static IP address, verify the default router has been configured. Refer to the “Assigning Default Router” section on page 5-15 section for details. If you are using DHCP, the DHCP server has not provided a default router. Check the DHCP server configuration. |
| No DNS server IP | Name was specified but DHCP or static IP configuration did not specify a DNS server address. | <ul style="list-style-type: none"> If the phone has a static IP address, verify the DNS server has been configured. Refer to the “Assigning DNS Servers” section on page 5-19 section for details. If you are using DHCP, the DHCP server has not provided a DNS server. Check the DHCP server configuration. |
| Programming Error | The phone failed during programming. | Attempt to resolve this error by power cycling the phone. If the problem persists, contact Cisco technical support for additional assistance. |
| SEPDefault.cnf.xml or SEPmacaddress | Name of the configuration file. | None. This is an informational message indicating the name of the file. |
| TFTP access error | TFTP server is pointing to a directory that does not exist. | <ul style="list-style-type: none"> If you are using DHCP, verify that the DHCP server is pointing to the correct TFTP server. If you are using static IP addresses, check configuration of TFTP server. Refer to the “Configuring TFTP Options” section on page 5-21 for details on assigning a TFTP server. |

Table 7-1 Status Messages (continued)

| Message | Explanation | Possible Explanation and Action |
|---------------------|---|---|
| TFTP file not found | The requested load file (.bin) was not found in the TFTPPath directory. | Check the load ID assigned to the phone (Cisco CallManager > Device > Phone). Verify that the TFTPPath directory contains a .bin file with this load ID as the name. |
| TFTP timeout | TFTP server did not respond. | <ul style="list-style-type: none"> • Network is busy—the errors should resolve themselves when the network load reduces. • No network connectivity between the TFTP server and the phone—verify the network connections. • TFTP server is down—check configuration of TFTP server. |

Displaying Network Statistics

Use the network statistics to obtain information about the phone and network performance.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use the Navigation button to select **Status**.
- Step 3** Press the **Select** soft key.
- Step 4** Select **Network Statistics**.
- Step 5** Press the **Select** soft key.

The following list defines components of text messages that might display on the phone's LCD screen:

- Rcv—number of packets received at the phone.
- Xmt—number of packets transmitted from the phone.

- RER—number of receive errors at the phone.
- Bcast—number of broadcast packets received.
- TCP-timeout—connection closed due to exceeding the allowed retry time.
- TCP-Bad-ACK—connection closed because an unacceptable ACK was received.
- CM-reset-TCP—Cisco CallManager closed and initiated the closing of connection.
- CM-closed-TCP—Cisco CallManager closed and initiated the closing of connection.
- CM-aborted-TCP—Cisco CallManager closed and initiated the closing of connection.
- CM-NAKed—Cisco CallManager refused the connection attempt.
- KeepaliveTO—phone closed because of a Keepalive Timeout.
- Failback—phone closed due failback to a higher priority Cisco CallManager.
- Phone-Loading—phone closed to upgrade software. This message appears only if TFTP fails during software upgrade.
- Phone-Keypad—phone closed due to a **** reset.
- Phone-Re-IP—phone closed due to a duplicate IP address condition.
- Reset-Reset—phone closed due to receiving a Reset/Reset from Cisco CallManager administration.
- Reset-Restart—phone closed due to receiving a Reset/Restart from Cisco CallManager administration.
- All-CMs-Bad—phone detected a state in which all Cisco CallManager servers failed their keepalives.
- Phone-Reg-Rej—phone closed due to receiving a registration reject.
- Phone-Initialized—phone has not experienced a connection close since the hardware reset or since it was powered on.
- Elapsed time—the amount of time that has elapsed since the phone connected to Cisco CallManager.
- Port 0 Full, 100—network port is in a link up state and has auto-negotiated a full-duplex 100 Mbps connection.

- Port 0 Half, 10—the network port is in a link up state and has auto-negotiated a half-duplex, 10-Mbps connection.
 - Port 1 Full, 100—the PC port is in a link up state and has auto-negotiated a full-duplex 100-Mbps connection.
 - Port 2 Down—PC port is in a link down state.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
- Step 2** Press **7** (Phone Info).
- Step 3** Use the Navigation button to display the available information:
- Application Load ID
 - Boot Load ID
 - Ethernet Port 1
 - Ethernet Port 2 (on the Cisco IP Phone 7910+SW)
 - Last Call Information (Codec Type)—Type of voice stream received (RTP streaming audio) (G.729, G.711 u-law, or G.711 A-law).
-

Verifying Model and Serial Number

You can verify the model and serial number on Cisco IP Phones.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use the Navigation button to select **Status**.

Step 3 Press the **Select** soft key.

Step 4 Select **Model Information**.

Step 5 Press the **Select** soft key.

The following information displays:

- Model Type
 - Serial Number
-

Cisco IP Phone 7910

Procedure

Step 1 Press **settings**.

Step 2 Press **4**(Model Information).

The following information displays:

- Model Type
 - Serial Number
-

Verifying Firmware Version

On the Cisco IP Phones, you can verify the firmware version loaded on the phone.

Cisco IP Phone 7960/7940

Procedure

Step 1 Press **settings**.

Step 2 Use the Navigation button to select **Status**.

Step 3 Press the **Select** soft key.

Step 4 Select **Firmware Versions**.

Step 5 Press the **Select** soft key.

The firmware statistics display the following information:

- Application Load ID
 - Boot Load ID
 - Version
 - Expansion Module 1
 - Expansion Module 2
-

Cisco IP Phone 7910

Procedure

Step 1 Press **settings**.

Step 2 Press **4**(Model Information).

Step 3 The following information displays:

- Application Load ID
 - Boot Load ID
-

Resetting the Cisco IP Phone

If you reset the phone, any changes made that have not been saved are lost and set back to default settings.

Cisco IP Phone 7960/7940:

Press ****#**** to reset the Cisco IP Phone 7960, and the phone cycles through normal startup procedures.

Cisco IP Phone 7910

Press *****##**** to reset the Cisco IP Phone 7910.

Erasing Local Configuration



If you want to erase all locally stored configuration options, you can erase the configuration and restore settings to their default values, including enabling DHCP.



Caution

Erasing the local configuration removes all user-defined changes made locally on the Cisco IP Phone. If you choose this option, these settings are set back to their default values.

Cisco IP Phone 7960/7940

Procedure

- Step 1** Press **settings**.
- Step 2** Use the Navigation button to select **Network Configuration**.
- Step 3** Press the **Select** soft key.
- Step 4** Scroll to **Erase Configuration**.

If the configuration is not set to be erased, the option displays as:

```
Erase Configuration No
```

- Step 5** Press the **Yes** soft key to erase the configuration.
 - Step 6** Press **Save**.
-

Cisco IP Phone 7910

Procedure

- Step 1** Press **settings**.
- Step 2** Press **6** (Network Configuration).
- Step 3** Use the **down** volume key to select **Erase Configuration**.
If the configuration is not set to be erased, the option displays as:
- ```
Erase Configuration
NO
```
- Step 4** Press **\*** to edit.
- Step 5** Use the **down** volume key to select **Yes**.
- Step 6** Press **#** to save.
- 

# Updating Firmware Version

You can only update the firmware version using the Cisco CallManager Administration application; you cannot update the firmware from the Cisco IP Phones directly.

### Before You Begin

Read the “Read Me” files included with Cisco software updates. These files provide important updated information about installing and configuring the new software.

### Procedure

---

- Step 1** Obtain an updated phone load.  
You can download the latest available software from the Cisco Service & Support Software Center:  
<http://www.cisco.com/kobayashi/sw-center/sw-voice.shtml>
- Step 2** Install the update.

- Step 3** From the Cisco CallManager Administration choose **System > Device Defaults**. Locate the **Device Type** field corresponding to the model IP Phone (IP Phone 7910, IP Phone 7960 or IP Phone 7940).
- Step 4** Enter the new device load in the **Load Information** field.
- You can typically locate this information in the Read Me file distributed with the software update.
- Cisco IP Phone 7960/7940—begins with P003
  - Cisco IP Phone 7910—begins with P004
- the device loads for each phone according to the read me file.
- Step 5** Click **Update**.
- Step 6** From Cisco CallManager Administration, choose **System > CallManager Group**.
- Step 7** From the Cisco CallManager Group list, choose the group you want to update.
- Step 8** Click **Reset Devices**.
- 

## Resolving Startup Problems

After installing a Cisco IP Phone into your network and adding it to Cisco CallManager, the phone should start up as described in [“Verifying the Phone Startup Process”](#) section on page 3-9. However, if the phone does not appear to be starting up properly, these sections can help you resolve the problem:

- [Symptom: Cisco IP Phone Does Not Start Up and LCD Screen Does Not Display, page 7-16](#)
- [Symptom: Cisco IP Phone Not Registering with Cisco CallManager, page 7-17](#)
- [Symptom: Cisco IP Phone Resetting, page 7-21](#)

## Symptom: Cisco IP Phone Does Not Start Up and LCD Screen Does Not Display

If you connect a Cisco IP Phone into the network port, the LEDs should light up and messages should appear on the LCD display (see the [“Verifying the Phone Startup Process”](#) section on page 3-9 for information on the normal startup process). If the phone does not proceed through this normal startup process, you must determine if the phone is functional or if anything else in the configuration is causing the phone to not start up properly.

To determine whether the phone is functional, you must eliminate any other potential problems, such as faulty cables, network outages, lack of power, and so on. Follow these suggestions to systematically eliminate these other causes.

### Procedure

---

- Step 1** To verify that the network port is functional:
- a. Exchange the Ethernet cables with cables you know are functional.
  - b. Disconnect a functioning Cisco IP Phone from another port and connect it to this network port to verify the port is active.
  - c. Connect the Cisco IP Phone that will not start up to a different, known good network port.
  - d. Connect the Cisco IP Phone that will not start up directly to the port on the switch, eliminating the patch panel connection in the office.
- Step 2** To verify that the phone is receiving power:
- a. Verify that the electrical outlet is functional.
  - b. If you are using in-line power, use the external power supply instead.
  - c. If you are using the external power supply, switch with a unit you know to be functional.
- Step 3** If after attempting these solutions, the LCD screen on the Cisco IP Phone persists in not displaying any characters for at least 5 minutes, contact a Cisco technical support representative for additional assistance.
-

## Symptom: Cisco IP Phone Not Registering with Cisco CallManager

If the phone proceeds past the first stage (LED buttons flashing on and off) and continues to cycle through the messages displaying on the LCD screen, then 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 CallManager server.

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

- [Identifying Error Messages, page 7-17](#)
- [Registering the Phone with Cisco CallManager, page 7-18](#)
- [Checking Network Connectivity, page 7-18](#)
- [Verifying TFTP Server Settings, page 7-18](#)
- [Verifying IP Addressing and Routing, page 7-19](#)
- [Verifying DNS Settings, page 7-19](#)
- [Verifying Cisco CallManager Settings, page 7-20](#)
- [Cisco CallManager and TFTP Services Are Not Running, page 7-20](#)
- [Creating a New Configuration File, page 7-21](#)

### Identifying Error Messages

As the phone is cycling through the startup process, you can access status messages that might provide you with information about the cause of the problem. On the Cisco IP Phone 7960/7940, press **settings** > **Status** > **Status Messages** to display these errors and refer to the “[Viewing Status Messages](#)” section on [page 7-3](#) section for a list of potential errors and their explanations and solutions.

## Registering the Phone with Cisco CallManager

Registration with a Cisco CallManager server can only be successful 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 CallManager Database” section on page 2-10](#) to ensure that the phone has been added to the Cisco CallManager database.

To verify that the phone is in the Cisco CallManager database, use **Device > Find** from Cisco CallManager to search for the phone based on its MAC Address. Verify the MAC address to search for by pressing **settings > Network Configuration > MAC address** on the phone.

If the phone is already in the Cisco CallManager database, its configuration file might be damaged. Refer to the [“Creating a New Configuration File” section on page 7-21](#) for assistance.

## Checking Network Connectivity

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

## Verifying TFTP Server Settings

The Cisco IP Phone uses the TFTP server setting (**settings > Network Configuration > TFTP Server 1**) to identify the Cisco CallManager server. If this setting is incorrect, the Cisco IP Phone might continually cycle while attempting to contact the identified TFTP Server.

If you have assigned a static IP address to the phone, you must manually enter this setting. Refer to the [“Configuring IP Settings” section on page 5-14](#).

If you are using DHCP, the phone obtains the address for the TFTP server from the DHCP server. Check the IP address configured in Option 150. See *Configuring Windows 2000 DHCP Server for Cisco Call Manager* on Cisco.com: [http://www.cisco.com/warp/customer/788/AVVID/win2000\\_dhcp.html](http://www.cisco.com/warp/customer/788/AVVID/win2000_dhcp.html)

You can also enable the phone to use an alternate TFTP server (**settings > Network Configuration > Alternate TFTP Server**). This is particularly useful if this phone was recently moved from a different location, such as a test lab to a production network.

You must unlock the network settings before you can assign an alternate TFTP server (see “[Accessing the Network Configuration Settings](#)” section on page 5-2).

## Verifying IP Addressing and Routing

You should verify the IP addressing and routing settings on the IP 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 IP Phone, press **settings > Network Configuration** and check for the following problems:

- DHCP Server—has no address

If you have assigned a static IP address to the phone, you do not need to enter a value here. However, if you are using a DHCP server, this field must have a value. If it does not, check your IP routing and VLAN configuration. See *Troubleshooting Switch Port Problems* on Cisco.com:

<http://www.cisco.com/warp/customer/473/53.shtml>

- IP address, subnet mask, or default router—have no addresses

If you have assigned a static IP address to the phone, you must manually enter these settings. Refer to the “[Configuring IP Settings](#)” section on page 5-14.

If you are using DHCP, check the IP addresses distributed by your DHCP server. See *Understanding and Troubleshooting DHCP in Catalyst Switch or Enterprise Networks* on Cisco.com: <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 Cisco CallManager, you must ensure you have specified a DNS server (**settings > Network Configuration > DNS Server 1**). You should also verify that you have a CNAME entry in the DNS server for the TFTP server and Cisco CallManager system.

You must also ensure that DNS is configured to do reverse look-ups. The default setting on Windows2000 is to perform forward-only look-ups.

## Verifying Cisco CallManager Settings

On the Cisco IP Phone, press **settings > Network Configuration > CallManager 1, 2, 3, 4**. The Cisco IP Phone attempts to open a TCP connection to all the Cisco CallManager servers that are part of the assigned CallManager group. If none of these fields have IP addresses or state “Active” or “Standby”, the phone is not properly registered with Cisco CallManager. Refer to the [“Registering the Phone with Cisco CallManager” section on page 7-18](#) for tips on resolving this problem.

## Cisco CallManager and TFTP Services Are Not Running

If the Cisco CallManager or TFTP services are not running, phones might not be able to start up properly. However, in this case, it is likely that you are experiencing a system-wide failure. Rather than being isolated to one phone that is experiencing problems, in this situation many or all phones and other devices are not able to start up properly.

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

### Procedure

- 
- Step 1** From the Cisco CallManager Administration window, choose **Application > Cisco CallManager Serviceability**.
- Step 2** Choose **Tools > Control Center**.
- Step 3** From the Servers column, choose the primary Cisco CallManager server.
- The window 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 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, despite all attempts at resolution, the configuration file might be corrupted. You can manually create a new configuration file by following the procedure below.

### Procedure

- 
- Step 1** From Cisco CallManager, select **Device > Phone > Find** to locate the phone experiencing problems.
  - Step 2** Choose **Delete** to remove the phone from the Cisco CallManager database.
  - Step 3** Search the hard drive of the Cisco CallManager server for files named SEP\*.cnf.xml. This file should be in a folder containing the configuration files for all the registered phones.
  - Step 4** Make a copy of a configuration file for a functional phone of the same type as the problematic phone. For example, if the phone experiencing problems is a Cisco IP Phone 7960, make a copy of a configuration file for another phone of this model.
  - Step 5** Rename this to match the name of the configuration file for the problematic phone.  
Use the convention SEP<MAC address>.cnf.xml, where <MAC address> is the MAC address for the deleted phone.
  - Step 6** Replace the old configuration file with the new one you created.
  - Step 7** Add the phone to Cisco CallManager database. See the [“Adding Phones Manually”](#) section on page 2-12 for details.
  - Step 8** Power cycle the phone.
- 

## Symptom: Cisco IP Phone Resetting

Once a Cisco IP Phone has properly started up and registered with Cisco CallManager, you can reset it, forcing it to go through the startup process. At times, you might want to intentionally do this. For example, if you want to

force a firmware upgrade from Cisco CallManager on to the phone. Anytime a phone has to load a new image, it has to restart itself and re-register with Cisco CallManager using the new image

However, if users report that their phones appear to be resetting during calls or while idle on their desk, you should investigate the cause. If the network connection and Cisco CallManager connection are stable, the Cisco IP Phone should not reset on its own.

Typically, the cause of the phones resetting can be categorized by problems connecting to the Ethernet network or to Cisco CallManager. These sections can help you identify the cause in your network:

- [Verifying Physical Connection, page 7-22](#)
- [Identifying Intermittent Network Outages, page 7-22](#)
- [Verifying DHCP Settings, page 7-23](#)
- [Checking Static IP Address Settings, page 7-23](#)
- [Verifying Voice VLAN Configuration, page 7-23](#)
- [Verifying that the Phones Have Not Been Intentionally Reset, page 7-23](#)
- [Eliminating DNS or Other Connectivity Errors, page 7-24](#)

## Verifying Physical Connection

Verify that the Ethernet connection to which the Cisco IP Phone is connected is up-and-running. 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, but data traffic can resend lost packets and verify 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.

Therefore, if you are experiencing problems with the voice network, you should investigate whether an existing problem is simply being exposed at this point.

## Verifying DHCP Settings

This procedure can help you verify if the phone has been properly configured to use DHCP.

### Procedure

- 
- Step 1** Verify that you have properly configured the phone to use DHCP. See the [“Modifying DHCP Settings” section on page 5-9](#) for details.
  - Step 2** Verify that the DHCP server has been set up properly.
  - Step 3** Verify the DHCP lease duration. Cisco recommends that you set it to 8 days.

Note, however, that Cisco 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 is 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 IP Settings” section on page 5-14](#).

## Verifying Voice VLAN Configuration

If the Cisco 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. See [“Understanding How the Cisco IP Phone Interacts with the Cisco Catalyst Family of Switches” section on page 2-2](#) for more details.

## Verifying that the Phones Have Not Been Intentionally Reset

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

You can check whether a Cisco IP Phone 7960/7940 received a command from Cisco CallManager to reset by pressing **settings > Status > Network Statistics** on the phone.

If the phone was recently reset one of these messages appears:

- Reset-Reset—phone closed due to receiving a Reset/Reset from Cisco CallManager administration.
- Reset-Restart—phone closed due to receiving a Reset/Restart from Cisco CallManager administration.

## Eliminating DNS or Other Connectivity Errors

If the phone continues to reset, follow this procedure.

### Procedure

- 
- Step 1** Reset the phone to factory defaults. See the “[Resetting the Cisco IP Phone](#)” section on page 7-12 for details.
- Step 2** Modify DHCP and IP settings.
- a. Disable DHCP. See the “[Modifying DHCP Settings](#)” section on page 5-9 for details.
  - b. Assign static IP values to the phone. See the “[Configuring IP Settings](#)” section on page 5-14 for details. Use the same default router setting used for other functioning Cisco IP Phones.
  - c. Assign TFTP server. See the “[Configuring TFTP Options](#)” section on page 5-21 for details. Use the same TFTP server used for other functioning Cisco IP Phones.
- Step 3** On the Cisco CallManager server, verify that the local host files have the correct Cisco CallManager server name mapped to the correct IP address. See the *Configuring The IP Hosts File on a Windows 2000 CallManager Server* on Cisco.com:  
[http://www.cisco.com/warp/customer/788/AVVID/cm\\_hosts\\_file.html](http://www.cisco.com/warp/customer/788/AVVID/cm_hosts_file.html)
- Step 4** From Cisco CallManager, select **System > Server** and verify that the server is being referred to by its IP address and not by its DNS name.
- Step 5** From Cisco CallManager, select **Device > Phone** and verify that you have assigned the correct MAC address to this Cisco IP Phone.

- Step 6** To verify the MAC address on the phone, see the [“Verifying Network Settings” section on page 5-3](#).
- Step 7** Power cycle the phone.
- 

## Resolving Known Issues

Refer to the following tables for troubleshooting some common issues that might occur on your Cisco IP Phones:

- [Table 7-2](#) describes restrictions or other known troubleshooting suggestions for the Cisco IP Phone models 7960, 7940 and 7910.
- [Table 7-3](#) describes restrictions or other known troubleshooting suggestions for the Cisco IP Phone 7914 Expansion Module.

**Table 7-2** *Cisco IP Phone Troubleshooting*

| Summary                                                                | Explanation                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Daisy-chaining IP phones                                               | Do not connect an IP phone to another IP phone through the access port. Each IP phone should directly connect to a switch port. If you connect IP phones together in a line (daisy-chaining), a problem with one phone can affect all subsequent phones in the line. Also, all phones on the line share bandwidth. |
| Poor quality when calling digital cell phones using the G.729 protocol | In Cisco CallManager, 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 CallManager server.                                                                                                                                                                   |

Table 7-2 Cisco IP Phone Troubleshooting (continued)

| Summary                                                     | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Moving a network connection from the phone to a workstation | <p data-bbox="532 287 1247 415">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.</p> <div data-bbox="565 435 608 472" style="text-align: center;">  </div> <p data-bbox="532 479 1247 732"><b>Caution</b> 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 prevent this, wait 10 seconds or longer after unplugging the cable from the phone. This 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.</p> |
| 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 <a href="#">“Accessing the Network Configuration Settings”</a> section on <a href="#">page 5-2</a> for details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Phone resetting                                             | The phone resets when it loses contact with the Cisco CallManager 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

Refer to the following table if you are having difficulty using your 7914 Expansion Module.

**Table 7-3** *Expansion Module Troubleshooting*

| <b>Problem</b>                                                     | <b>Solution</b>                                                                                                 |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| No display on the 7914 Expansion Module                            | Verify that all of the cable connections are correct.<br>Verify that you have power to the Expansion Module(s). |
| Lighted buttons on the first 7914 Expansion Module are all red.    | Verify that the 7914 Expansion Module is defined in Cisco CallManager.                                          |
| Lighted buttons on the second 7914 Expansion Module are all amber. | Verify that the 7914 Expansion Module is defined in Cisco CallManager.                                          |





# Technical Specifications

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The following sections describe the technical specifications for the Cisco IP Phone.

- [Physical and Operating Environment Specifications, page A-1](#)
- [Cable Specifications, page A-2](#)
- [Network and Access Port Pinouts, page A-2](#)

## Physical and Operating Environment Specifications

[Table A-1](#) includes the physical and operating environment specifications for the Cisco IP Phone.

**Table A-1** *Cisco IP Phone Specifications*

| Specification               | Value or Range               |
|-----------------------------|------------------------------|
| Operating temperature       | 0° to 40°C (32° to 104°F)    |
| Operating relative humidity | 10% to 95% (non-condensing). |
| Storage temperature         | -10° to 60°C (14° to 140°F)  |
| Height                      | 20.32 cm (8 in.)             |
| Width                       | 26.67 cm (10.5 in.)          |
| Depth                       | 15.24 cm (6 in.)             |

**Table A-1 Cisco IP Phone Specifications (continued)**

| Specification         | Value or Range                                                                                                                                                                          |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Weight                | <ul style="list-style-type: none"> <li>• Cisco IP Phone 7960/7940—1.6 kg (3.5 lb)</li> <li>• Cisco IP Phone 7910—1.0 kg (2.2 lb)</li> </ul>                                             |
| Power                 | <ul style="list-style-type: none"> <li>• 100-240 VAC, 50-60 Hz, 0.5 A—when using the AC adapter</li> <li>• 48 VDC, 0.2 A—when using the in-line power over the network cable</li> </ul> |
| Cables                | Two (2) pair of Category 3 for 10-Mbps cables<br>Two (2) pair of Category 5 for 100-Mbps cables                                                                                         |
| Distance Requirements | As supported by the Ethernet Specification, it is assumed that most Cisco IP Phones should be within 100m (330 feet) of a phone closet.                                                 |

## Cable Specifications

- RJ-11 jack for handset connection
- RJ-45 jack for the LAN 10/100BaseT connection (labeled LAN)
- RJ-45 jack for a second 10/100BaseT compliant connection (labeled PC)
- 48-volt power connector. The diameter of the center pin in the phone power jack (Switchcraft 712A) is .1 inch (2.5 mm). The center pin is positive (+) voltage. The miniature power plug required to mate with the power jack on the phone is a Switchcraft 760 or equivalent.

## Network and Access Port Pinouts

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

### Network Port Connector

[Table A-2](#) describes the network port connector pinouts.

**Table A-2 Network Port Connector Pinouts**

| Pin Number | Function                      |
|------------|-------------------------------|
| 1          | TD+                           |
| 2          | TD-                           |
| 3          | RD+                           |
| 4          | +48 Volts return <sup>1</sup> |
| 5          | +48 Volts return <sup>1</sup> |
| 6          | RD-                           |
| 7          | +48 Volts source <sup>1</sup> |
| 8          | +48 Volts source <sup>1</sup> |

1. When used to receive power from an inline power card in the Cisco Catalyst switch.

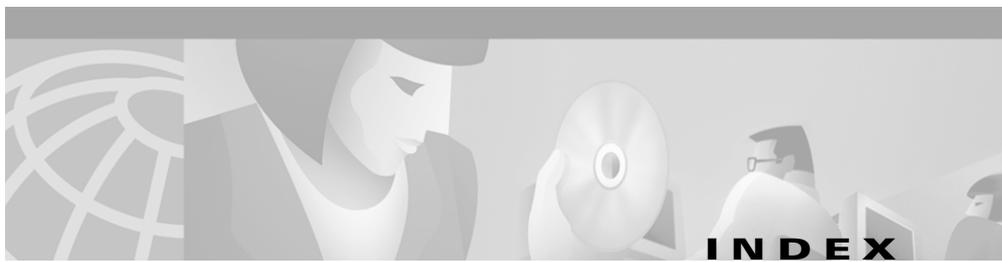
### Access Port Connector

Table A-3 describes the access port connector pinouts.

**Table A-3 Access Port Connector Pinouts**

| Pin Number | Function |
|------------|----------|
| 1          | RD+      |
| 2          | RD-      |
| 3          | TD+      |
| 4          | Not Used |
| 5          | Not Used |
| 6          | TD-      |
| 7          | Not Used |
| 8          | Not Used |





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## A

- AC adapter, providing power using [2-7](#)
- access port, purpose [2-7](#)
- adding
  - Cisco IP Phones manually [2-12](#)
  - Cisco IP Phones that use DHCP [2-12](#)
  - Cisco IP Phones using auto-registration [2-11](#)
  - Cisco IP Phones using Bulk Administration Tool [2-15](#)
- adding, users to Cisco CallManager [6-5](#)
- adjusting, phone placement of [3-7](#)
- assigning
  - default gateway [5-15](#)
  - DNS servers [5-19](#)
  - domain name [5-18](#)
  - IP address [5-14](#)
  - subnet mask [5-17](#)
  - TFTP server [5-21](#)
- attaching, Expansion Module [4-5](#)
- audience, for this document [ix](#)
- audio compression, supported [1-1](#)
- auto-registration, using [2-11](#)

---

## B

- Bulk Administration Tool
  - adding phones with [2-15](#)

---

## C

- call, statistics for [6-2](#)
- Cisco CallManager
  - adding phone to database of [2-10](#)
  - interactions with [2-2](#)
- Cisco CallManager Administration application
  - context-sensitive help for [2-11](#)
  - online help for [2-11](#)
- Cisco Catalyst switches
  - interaction with [2-2](#)
- Cisco IP Phone
  - adding [2-10](#)
  - configuring user services [6-8](#)
  - installation procedure [3-4](#)
  - installation requirements [1-12](#)
  - modifying phone button templates [6-5](#)
  - mounting to wall [3-7](#)
  - power sources [2-7](#)
  - registering [2-10](#)

- resetting [6-12](#)
- supported networking protocols [1-7](#)
- technical specifications [A-1](#)
- troubleshooting [6-1](#)
- using LDAP directories [6-8](#)

Cisco IP Phone 7910, features [1-5](#)

Cisco IP Phone 7914 Expansion Module

- configuring IP Phone for [2-15](#)
- connecting footstand for [4-12](#)
- features of [4-1](#)
- installing preparation [4-2](#)
- speed dial service for [2-16](#)
- startup process [4-14](#)
- steps for connecting [4-4](#)
- troubleshooting [6-27](#)

Cisco IP Phone 7940, features [1-2](#)

Cisco IP Phone 7960, features [1-2](#)

configuring

- LDAP directories [6-8](#)
- phone button templates [6-5](#)
- ports [5-25](#)
- startup network settings [3-10](#)
- user features [6-5](#)
- VLAN settings [5-20](#)

conventions [xvi](#)

---

## D

default gateway, assigning [5-15](#)

## DHCP

- adding phones that use [2-12](#)
- disabling [5-11](#)
- enabling [5-10](#)
- releasing addresses [5-12](#)

directory numbers

- assigning manually [2-12](#)

displaying, network statistics [6-8](#)

DNS servers, assigning [5-19](#)

documentation

- additional [xi](#)
- for users [6-10](#)

domain name, assigning [5-18](#)

---

## E

erasing, local configuration [6-13](#)

Expansion Module

- configuring IP Phone for [2-15](#)
- connecting footstand for [4-12](#)
- features of [4-1](#)
- installing preparation [4-2](#)
- speed dial service for [2-16](#)
- startup process [4-14](#)
- steps for connecting [4-4](#)
- troubleshooting [6-27](#)

---

**F**

## features

- configuring on phone [1-11](#)
- configuring with Cisco CallManager [1-10](#)
- informing users about [1-11](#)
- phone features (table) [6-2](#)

## firmware

- updating [6-14](#)
- verifying version [6-11](#)

---

**H**

## headset

- supported types [2-9](#)
- using [2-9](#)

---

**I**

inline switching module, providing power using [2-7](#)

## installing

- Cisco CallManager configuration [3-2](#)
- network requirements [3-2](#)
- preparation for Expansion Module [4-2](#)
- preparing [2-10](#)
- procedure [3-4](#)
- safety warnings [3-3](#)

IP address, assigning [5-14](#)

---

**L**

LDAP directories, using with Cisco IP

Phone [6-8](#)

local configuration, erasing [6-13](#)

---

**N**

## network connections

- access port [2-7](#)
- network port [2-6](#)

## networking protocol

- BootP [1-7](#)
- CDP [1-7](#)
- DHCP [1-8](#)
- IP [1-8](#)
- RTP [1-8](#)
- TFTP [1-9](#)
- UPD [1-9](#)

networking protocols, supported [1-7](#)

networking settings, accessing [5-2](#)

network port, purpose [2-6](#)

## network settings

- accessing [5-2](#)
- startup configuration [3-10](#)

---

**P**

phone button templates

7910, default template [6-7](#)

- 7914 Expansion Module, default template [6-7](#)
- 7940, default template [6-6](#)
- 7960, default template [6-6](#)
- modifying [6-5](#)
- phones
  - features described (table) [6-2](#)
- plugging in Cisco IP Phone [3-4](#)
- ports, configuring [5-25](#)
- power patch panel, providing power using [2-7](#)
- power source
  - design of [2-7](#)
  - external [2-7](#)
  - for Expansion Module [4-11](#)
  - inline power from Cisco Catalyst switches [2-7](#)
  - power patch panel [2-7](#)
  - redundancy for [2-8](#)

---

## R

- resetting, Cisco IP phone [6-12](#)

---

## S

- safety warnings
  - for Expansion Module installation [4-3](#)
  - for installation [3-3](#)
- services
  - configuring for users [6-8](#)

- subscribing to [6-8](#)
- startup process
  - accessing TFTP server [2-5](#)
  - configuring VLAN [2-4](#)
  - contacting Cisco CallManager [2-5](#)
  - for Expansion Module [4-14](#)
  - loading stored phone image [2-4](#)
  - obtaining IP address [2-4](#)
  - obtaining power [2-4](#)
  - requesting configuration file [2-5](#)
  - understanding [2-3](#)
  - verifying [3-9](#)
- statistics
  - for current call [6-2](#)
  - for network [6-8](#)
- status, viewing messages [6-3](#)
- subnet mask, assigning [5-17](#)

---

## T

- technical specifications, for Cisco IP Phone [A-1](#)
- templates, phone button
  - 7910, default [6-7](#)
  - 7914 Expansion Module, default [6-7](#)
  - 7940, default [6-6](#)
  - 7960, default [6-6](#)
- TFTP server
  - assigning [5-21](#)
  - using alternate [5-23](#)

## troubleshooting

Cisco IP Phone [6-1](#)

Expansion Module [6-27](#)

---

## U

### understanding

interactions with Cisco CallManager [2-2](#)

interactions with Cisco Catalyst switches [2-2](#)

startup process [2-3](#)

### users

adding to Cisco CallManager [6-5](#)

---

## V

### verifying

firmware version [6-11](#)

startup process [3-9](#)

### VLAN settings

configuring [5-20](#)

---

## W

wall mounting, Cisco IP Phone [3-7](#)

