



# Product Overview

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## New Information in This Release

The following is new with this release of the Cisco MGCP IP 7960G/7940G phone:

### Release 6.0

- New digital-signal-processor (DSP) firmware.
- DSP alarm-status and error-message-reporting capabilities using the **debug dsp** and **show dsp** commands. You can log your session, by means of console or Telnet, and save the log to a file.
- DHCP option 60 has been added so that the phone can identify itself with vendor-specific information.
- Personal directory functionality for storing up to 32 unique numbers. The **Add** softkey allows you to enter a name and number.
- A new clear message-waiting indicator (MWI) command for use with a console and Telnet.

### Release 6.1

- DHCP option 61 has been added so that the phone can identify itself with vendor-specific information.

- New configurable parameters have been added. See [Appendix B, “Configurable Parameters for the MGCP IP Phone.”](#)

#### Release 7.0 and 7.1

- Universal application loader functionality has been added.
- Microphone sensitivity has been increased.
- UDP Fragmentation has been increased to 2434 bytes.
- New upgrade procedures are provided for Version 7.0 and 7.1. See the “Upgrading to Versions 7.0 and Later Releases” section on page 4-5 of [Chapter 4, “Managing Cisco MGCP IP Phones.”](#)

#### Release 7.3 and 7.4

MGCP NAT support has been added. See the [MGCP NAT Support](#) section of [Chapter 4, “Managing Cisco MGCP IP Phones.”](#)

Caveats for all releases can be found on the product release notes page at the following URL:

[http://www.cisco.com/univercd/cc/td/doc/product/voice/c\\_ipphon/english/ipp7960/addprot/mgcp/relnotes/](http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/english/ipp7960/addprot/mgcp/relnotes/)

## Cisco IP 7960G/7940G Phone Overview

Cisco IP 7960G/7940G phones are full-featured telephones that can be plugged directly into an MGCP network and can be used very much like a standard PBX telephone. The Cisco IP 7960G/7940G phone terminals can attach to the existing data network infrastructure, using 10BASE-T and 100BASE-T interfaces on an Ethernet switch.

When used with a voice-capable Ethernet switch, one that understands type of service (ToS) bits and can prioritize VoIP traffic, the phones eliminate the need for a traditional proprietary telephone set and key system or PBX.

The phone works with a third-party call agent (CA) that uses Media Gateway Control Protocol (MGCP) for call control and Basic Telephony eXtensible Markup Language (BTXML) for control of the phone displays and feature keys. Refer to your CA documentation for descriptions of all other phone features, displays, and applications that are not described in this guide.

The Cisco IP 7960G/7940G phone also supports an adjustable ring tone, a hearing-aid compatible handset, and a headset.

See [Figure 1-1](#) and [Figure 1-2](#) to identify the buttons and hardware on your Cisco IP phone.











Figure 1-1 Cisco IP Phone 7960



Figure 1-2 Cisco IP Phone 7940



1	Handset with indicator light	The light strip at the top of the handset blinks when the phone rings and can be set to remain lit when there is a voice message.
2	LCD screen	Displays information about the Cisco IP phone, such as the time, date, phone number, caller ID, line and call status, and the soft key tabs. The screen is 4.25 x 3 inches (10.79 x 7.62 cm) and has an adjustable contrast.
3	Cisco IP Phone model type	Indicates the Cisco IP phone model.
4	Line or speed-dial button	Opens a new line or speed-dials the number on the LCD screen. Phones in the Cisco IP Phone 7960 series have six line or speed-dial buttons, and phones in the 7940 series have two.

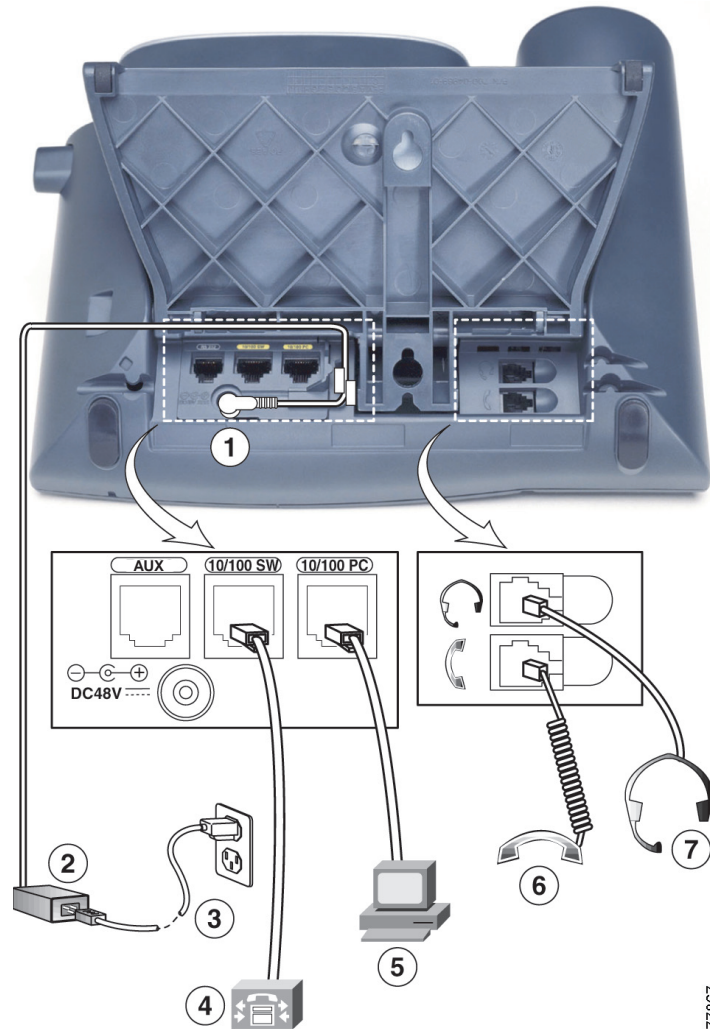
5	Footstand adjustment	Allows adjustment of the angle of the phone base.
6	Directories button 	Provides access to call histories and directories.
7	<i>i</i> or ? button 	Provides online help for selected keys or features and network statistics about the active call. Pressing the button and then the up or down scroll key displays a descriptor of the key. For example, pressing the <i>i</i> or ? button, and then the up or down scroll key displays a screen that instructs you how to scroll up and down on the LCD.
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 the volume for the handset, headset, or speakerphone (depending upon which is currently active). Also controls the ringer volume (if the handset is in its cradle) and the LCD screen contrast.
13	Services button 	Provides access to any available phone services.
14	Messages button 	Provides access to a message system, if available.
15	Navigation button 	Allows scrolling through text and selection of features displayed on the LCD screen.
16	Dial pad	Works exactly like the dial pad on a traditional telephone.
17	Soft keys	Activates any functions displayed on the corresponding LCD screen tabs. Soft keys point to feature options displayed along the bottom of the LCD screen.

**Note**

Refer to your call-agent (CA) or service-provider documentation for additional functionality.

Figure 1-3 shows the connections on the back of the Cisco IP phone. Cisco IP 7960G/7940G phones have the same hardware configuration.

Figure 1-3 Cisco IP Phone Cable Connection



- |   |   |
|---|---|
| 1 | AC/DC adapter port (DC48V) for power connector. For redundancy, you can use the AC adapter even if you are using inline power from Cisco Catalyst switches. The Cisco IP 7960G/7940G phone can share the power 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.   |
| 2 | Power supply with AC plug.  |
| 3 | Power cable with wall socket plug for connecting to power.  |
| 4 | Network port (10 and 100 SW) RJ-45 to connect the phone to the network supporting 10- or 100-Mbps half- or full-duplex Ethernet connections to external devices. You can use either Category 3 or Category 5 cabling for 10-Mbps connections, but use Category 5 for 100-Mbps connections. To avoid collisions, use full-duplex mode. 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. |

5	Access port (10 and 100 PC) RJ-45 to connect a network device, such as a computer, to the phone supporting from 10- to 100-Mbps half- or full-duplex Ethernet connections to external devices. You can use either Category 3 or Category 5 cabling for 10-Mbps connections, but use Category 5 for 100-Mbps connections. To avoid collisions, use full-duplex mode. You must use a straight-through cable on this port.
6	Handset port for connecting a handset.
7	<p>Headset port for connecting a headset. Enables the headset. The phone supports a four- or six-wire headset jack. The volume and mute controls also adjust volume to the earpiece and mute the speech path of the headset. The headset activation key is located on the front of the Cisco IP 7960G/7940G phone.</p> <p>The phone supports the following Plantronics four- or six-wire headsets: Tristar Monaural, Encore Monaural H91, and Encore Binaural H101.</p> <p>When a headset is used, an amplifier is not required. However, a coil cord is required to connect the headset to the headset port on the back of your Cisco IP 7960G/7940G phone. For information on ordering compatible headsets and coil cords for the Cisco IP 7960G/7940G phone, go to <a href="http://cisco.getheadsets.com">http://cisco.getheadsets.com</a> or <a href="http://vxicorp.com/cisco">http://vxicorp.com/cisco</a>.</p>

## Media Gateway Control Protocol Overview

Media Gateway Control Protocol (MGCP) is the Internet Engineering Task Force (IETF) standard for multimedia conferencing over IP. MGCP is an ASCII-based, application-layer control protocol (defined in RFC 2705) that can be used to establish, maintain, and terminate calls between two or more endpoints.

Like other VoIP protocols, MGCP is designed to address the functions of signaling and session management within a packet telephony network. Signaling allows call information to be carried across network boundaries. Session management provides the ability to control the attributes of an end-to-end call.

One aspect of MGCP that differs from other VoIP protocols is that MGCP relies on a control server, or call agent (CA), to control call progression, tones to apply, and call characteristics. MGCP endpoints carry out instructions from the CA, which controls how calls proceed.

MGCP allows a control server to do the following:

- Determine the location of the target endpoint.
- Determine the media capabilities of the target endpoint. Using Session Description Protocol (SDP), MGCP determines the lowest level of common service between the endpoints. Conferences are established using only the media capabilities that can be supported by all endpoints.
- Determine the availability of the target endpoint.
- Establish a session between the originating and target endpoint. If the call can be completed, MGCP establishes a session between the endpoints. MGCP also supports midcall changes, such as the addition of another endpoint to the conference or the changing of a media characteristic or codec.



### Note

Conferences consist of two or more users and can be established by means of multicast or multiple unicast sessions. A conference is an established session (or call) between two or more endpoints. In this document, the terms conference and call are used interchangeably.

MGCP is a client/server protocol. The CA handles all aspects of setting up calls to and from endpoints. CAs or control servers provide the feature capabilities that a particular endpoint can use. Endpoints connected to different CAs likely have a different set of features that they can use. Because all call-control features are in the control server, each control server vendor decides which features are most important, and therefore different control server vendors differ in essential features.

## BTXML Support

The Cisco MGCP IP phone supports Basic Telephony eXtensible Markup Language. BTXML defines XML elements for controlling the user interface of an IP telephone. It describes what information is displayed on the screen and how to provide input using soft keys and hard keys.

For information about creating and using BTXML scripts on the phone, refer to the *Cisco IP Phone MGCP BTXML Version 2.0 Application Development Guide*.

## Cisco CallManager XML Support

The Cisco MGCP IP phone supports Cisco CallManager XML cards that you configure to provide data such as stock quotes, calendars, and directory lookups. Phone users access this information using phone buttons such as the Services or Directories buttons or soft keys. See [Chapter 4, “Managing Cisco MGCP IP Phones,”](#) for information about configuring these cards.

The phone supports Cisco CallManager XML up through version 3.0. It does not support the following XML objects in version 3.1 and later: CiscoIPPhoneIconMenu, CiscoIPPhoneExecute, CiscoIPPhoneError, and CiscoIPPhoneResponse.

For more information about using XML on your Cisco MGCP IP phone, refer to the following:

- IP Telephony  
<http://www.hotdispatch.com/cisco-ip-telephony>
- Cisco Call Manager Services Developer Kit  
[http://www.cisco.com/pcgi-bin/dev\\_support/access\\_level/product\\_support](http://www.cisco.com/pcgi-bin/dev_support/access_level/product_support)
- *Developing Cisco IP Phone Services* by Darrick Deel, Mark Nelson, and Anne Smith, ISBN 1-58705-060-9

## Supported Network Features

The Cisco MGCP IP phone supports the following network features. Depending on the features that your CA supports, some of these features may not be available on your phone.

- Interoperability with third-party CAs.
- Up to six MGCP connections and call appearances.
- Network startup using DHCP and TFTP.
- Telnet support—You can configure the phone to use Telnet to connect directly to the phone to debug and troubleshoot. See [Chapter 4, “Managing Cisco MGCP IP Phones,”](#) for more information on configuration parameters.
- Ping support—You can ping a specific Cisco IP phone to see if it is operational and how long the response time is from the phone.

- Traceroute support—You can use “traceroute” to see the path that a phone traverses in the route to its desired destination.
- Remote reset support—You can configure a phone to enable a service provider to reset a phone from a remote site. This feature provides a key tool for restarting the phone registration process with the service provider call agent or proxy and for receiving a new or updated configuration or firmware load from a designated TFTP server.

## Supported Codecs and Dual Tone Multifrequency

The Cisco MGCP IP phone supports the following codecs:

- G.711 mu-law codec
- G.711 a-law codec
- G.729a codec

The phone also supports dual tone multifrequency (DTMF) out-of-band signaling for G.729a codecs compliant to RFC 2833.

## Dialing and Messaging Features

The Cisco MGCP IP phone supports the following dialing and messaging features:

- Message-waiting indication—Lights to indicate that a new voice message is in a subscriber mailbox. If the user listens to the message but does not save or delete it, the light remains on. If a user listens to the message and saves or deletes it, the light goes off. The message-waiting indicator (MWI) is controlled by the voice-mail server. The indication is saved over a phone upgrade or reboot.
- Notified entity—A CA can direct an endpoint to send notify messages to an alternate destination.
- Call waiting, call transfer, call forward (unconditional, busy, no answer), announcement, music on hold, and volume control. These features must be supported by the CA.
- Three-way calling using an external multipoint control unit (MCU). This feature must be supported by the CA.

## Supported MGCP Commands

The Cisco MGCP IP phone supports the MGCP commands shown in [Table 1-1](#).

**Table 1-1** MGCP Commands

Command	Description	Direction
Notification Request	Specifies events that generate notifications to the CA.	CA to phone
Create Connection	Creates an RTP connection.	CA to phone
Modify Connection	Modifies an existing RTP connection.	CA to phone
Delete Connection	Deletes an endpoint RTP connection.	CA to phone
Audit Endpoint	Queries endpoint status.	CA to phone
Audit Connection	Queries connection status.	CA to phone

Table 1-1 MGCP Commands (continued)

Command	Description	Direction
Restart in Progress	Notifies the CA of the endpoint's service state change.	Phone to CA
Endpoint Configuration	Specifies encoding for audio signals.	CA to phone
Notification	Indicates event occurrences.	Phone to CA

## Supported Languages and Character Set

The Cisco MGCP IP phone supports the ISO 8859-1 Latin1 characters and the following languages: French (fr), Spanish (es), Catalan (ca), Basque (eu), Portuguese (pt), Italian (it), Albanian (sq), Rhaeto-Romanic (rm), Dutch (nl), German (de), Danish (da), Swedish (sv), Norwegian (no), Finnish (fi), Faroese (fo), Icelandic (is), Irish (ga), Scottish (gd), English (en), Afrikaans (af), and Swahili (sw).

It does not support the following languages: Zulu (zu) and other Bantu languages using Latin Extended-B letters; Arabic in North Africa; and Guarani (gn), which is missing the letters G, E, I, U, and Y with tildes (~).

You can use ISO 8859-1 Latin1 characters in the following areas:

- Caller ID information—When an MGCP message is received with ISO 8859-1 Latin1 characters in the caller ID strings, those caller ID strings are displayed on the phone LCD with the correct ISO 8859-1 Latin1 characters.
- Cisco CallManager XML—Services menu applications are written in Cisco CallManager XML (CMXML). You can write language-specific applications for a particular region. For example, you can write an application that displays the current weather in Sweden using Swedish language characters. If you write the same application for a Spanish town, the characters you select could translate the application into Spanish.
- Call-control displays (external MGCP XML card deck)—The XML deck used for MGCP call control is downloaded to the phone, and those XML cards can be translated into the local language.
- Line-key labels—Line-key labels are set using an MGCP message that sets the label to the string provided. Strings that contain ISO 8859-1 Latin1 characters are displayed properly.
- Soft-key labels—Soft-key labels are set using XML cards. XML cards, including call-control cards and services applications, can provide soft keys with ISO 8859-1 Latin1 characters.



### Note

The *i* button text and the Settings menu are in English. These items are built into the phone image and cannot be changed.

# Supported Protocols

The Cisco MGCP IP phone supports the following protocols.

**Table 1-2 Supported Protocols**

Protocol	Description
DHCP	<p>Dynamic Host Configuration Protocol. Client or manually configured using a local setup menu. DHCP is used to allocate and assign IP addresses. DHCP allows you to move network devices from one subnet to another without administrative attention. It allows connection of Cisco MGCP IP phones to the network so that they become operational without having to manually assign an IP address and additional network parameters.</p> <p>The Cisco MGCP IP phone supports DHCP as defined in RFC 2131. By default, the phone is DHCP-enabled.</p>
DNS	<p>Domain Name System. Used in the Internet for translating names of network nodes into addresses. MGCP uses DNS to resolve the host names of endpoints into IP addresses.</p>
Dynamic DNS and TFTP	<p>You can configure additional DNS and TFTP servers. Upon bootup, the phone first goes to the default TFTP server to download the configuration files. If a new dynamic TFTP server is specified in the files, the phone requests a new set of files from the specified server. If new DNS addresses are specified in the files, the phone uses those addresses for lookups.</p>
HTTP	<p>Hypertext Transfer Protocol. The phone contains limited support for HTTP 1.1. The phone uses HTTP to retrieve Cisco CallManager XML files.</p>
ICMP	<p>Internet Control Message Protocol. A network-layer Internet protocol that enables hosts to send error or control messages to other hosts. ICMP also provides other information relevant to IP packet processing. The Cisco MGCP IP phone supports ICMP as defined in RFC 792.</p>
IP	<p>Internet Protocol. A network layer protocol that sends datagram packets between nodes on the Internet. IP also provides features for addressing, type-of-service (ToS) specification, fragmentation and reassembly, and security. The Cisco MGCP IP phone supports IP as defined in RFC 791.</p>
RTP	<p>Real-Time Transport Protocol. Supports transport of real-time data (such as voice data) over data networks. RTP also has the ability to obtain quality-of-service (QoS) information. The phone supports RTP as a media channel.</p>
SDP	<p>Session Description Protocol. An ASCII-based protocol that describes multimedia sessions and their related scheduling information. Third-party call control is supported using delayed media negotiation, which is SDP data that is not completely advertised in the initial call setup. SDP also supports endpoints specified as fully qualified domain names (FQDNs). The Cisco MGCP IP phone uses SDP for session description.</p>
SNTP	<p>Simple Network Time Protocol. Synchronizes computer clocks on an IP network. Current date and time are supported using SNTP including time zone and daylight saving time. The Cisco MGCP IP phone uses SNTP for date and time support.</p>

**Table 1-2 Supported Protocols (continued)**

Protocol	Description
TCP	Transmission Control Protocol. Provides a reliable byte-stream transfer service between endpoints on the Internet. The Cisco MGCP IP phone uses TCP for Telnet and HTTP sessions.
TFTP	Trivial File Transfer Protocol. Allows files to be transferred from one computer to another over a network. The Cisco MGCP IP phone uses TFTP to download configuration files and software updates.
ToS	Type of service. An indication of how an upper-layer protocol requires a lower-layer protocol to treat its messages. In SNA subarea routing, ToS definitions are used by subarea nodes to determine the optimal route to establish a given session. A ToS definition comprises a virtual route number and a transmission priority field. Also called class of service (CoS).
UDP	User Datagram Protocol. Exchanges data packets without acknowledgments or guaranteed delivery. An MGCP network can use UDP as the underlying transport protocol. If UDP is used, retransmissions are used to ensure reliability.
VAD	Voice activity detection. When enabled on a voice port or a dial peer, silence is not transmitted over the network, only audible speech. Sound quality is slightly degraded, but the connection monopolizes much less bandwidth.

## Where to Go Next

- See [Chapter 2, “Installing Cisco IP 7960G/7940G Phone Hardware on the Desktop or Wall,”](#) for placement of the phone on the desktop or wall and for cabling information.
- See [Chapter 3, “Initializing Cisco MGCP IP Phones,”](#) for installation of the firmware and connecting the phone to power sources and the network.
- See [Chapter 4, “Managing Cisco MGCP IP Phones,”](#) for upgrading firmware and performing other management tasks.
- See [Chapter 5, “Monitoring Cisco MGCP IP Phones,”](#) for information on debugging and on viewing network statistics.

