



Troubleshooting and Maintenance

This chapter provides information that can assist you in troubleshooting problems with your Cisco IP Phone 7970 or with your IP telephony network. It also explains how to clean and maintain your phone.

For additional troubleshooting information, refer to the *Using the 79xx Status Information For Troubleshooting* tech note. This document is available to registered Cisco.com users at this URL:

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

This chapter includes these topics:

- [Resolving Startup Problems, page 9-2](#)
- [General Troubleshooting Tips, page 9-11](#)
- [Resetting the Cisco IP Phone, page 9-13](#)
- [Using the Quality Report Tool, page 9-15](#)
- [Where to Go for More Troubleshooting Information, page 9-15](#)
- [Cleaning the Cisco IP Phone, page 9-16](#)

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 the “[Verifying the Phone Startup Process](#)” section on page 3-13. If the phone does not start up properly, see the following sections for troubleshooting information:

- [Symptom: The Cisco IP Phone Does Not Go Through its Normal Startup Process, page 9-2](#)
- [Symptom: The Cisco IP Phone Does Not Register with Cisco CallManager, page 9-3](#)
- [Symptom: Cisco IP Phone Resets Unexpectedly, page 9-8](#)

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

When you connect a Cisco IP Phone into the network port, the phone should go through its normal startup process and the LCD screen should display information. If the phone does not go through the startup process, the cause may be faulty cables, bad connections, network outages, lack of power, and so on. Or, the phone may not be functional.

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

1. Verify that the network port is functional:
 - Exchange the Ethernet cables with cables that you know are functional.
 - Disconnect a functioning Cisco IP Phone from another port and connect it to this network port to verify the port is active.
 - Connect the Cisco IP Phone that will not start up to a different network port that is known to be good.
 - 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.

2. Verify that the phone is receiving power:
 - Verify that the electrical outlet is functional.
 - If you are using in-line power, use the external power supply instead.
 - If you are using the external power supply, switch with a unit you know to be functional.

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

Symptom: The Cisco IP Phone Does Not Register with Cisco CallManager

If the phone proceeds past the first stage of the startup process (LED buttons flashing on and off) but continues to cycle through the messages displaying on the LCD screen, 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 9-4](#)
- [Registering the Phone with Cisco CallManager, page 9-4](#)
- [Checking Network Connectivity, page 9-4](#)
- [Verifying TFTP Server Settings, page 9-4](#)
- [Verifying IP Addressing and Routing, page 9-5](#)
- [Verifying DNS Settings, page 9-6](#)
- [Verifying Cisco CallManager Settings, page 9-6](#)
- [Cisco CallManager and TFTP Services Are Not Running, page 9-6](#)
- [Creating a New Configuration File, page 9-7](#)

Identifying Error Messages

As the phone cycles through the startup process, you can access status messages that might provide you with information about the cause of a problem. See the [“Status Messages Screen” section on page 7-3](#) for instructions about accessing status messages and for a list of potential errors, their explanations, and their solutions.

Registering the Phone with Cisco CallManager

A Cisco IP Phone can register with a Cisco CallManager server only if the phone has been added to the server or if auto-registration is enabled. Review the information and procedures in the [“Adding Phones to the Cisco CallManager Database” section on page 2-5](#) to ensure that the phone has been added to the Cisco CallManager database.

To verify that the phone is in the Cisco CallManager database, choose **Device > Find** from Cisco CallManager to search for the phone based on its MAC Address. You can determine the MAC address to search for by pressing the **Settings** button on the phone, choosing **Network Configuration**, and scrolling to the **MAC address** option.

If the phone is already in the Cisco CallManager database, its configuration file might be damaged. See the [“Creating a New Configuration File” section on page 9-7](#) 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 running.

Verifying TFTP Server Settings

You can determine the IP address of the TFTP server used by the phone by pressing the **Settings** button on the phone, choosing **Network Configuration**, and scrolling to the **TFTP Server 1** option.

If you have assigned a static IP address to the phone, you must manually enter a setting for the TFTP Server 1 option. See the “[Network Configuration Menu](#)” section on page 4-4.

If you are using DHCP, the phone obtains the address for the TFTP server from the DHCP server. Check the IP address configured in Option 150. Refer to *Configuring Windows 2000 DHCP Server for Cisco CallManager*, available at this URL:

http://www.cisco.com/warp/customer/788/AVVID/win2000_dhcp.html

You can also enable the phone to use an alternate TFTP server. Such a setting is particularly useful if this phone was recently moved from one location to another. See the “[Network Configuration Menu](#)” section on page 4-4 for instructions.

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 the **Settings** button, choose **Network Configuration**, and look at the following options:

- **DHCP Server**—If you have assigned a static IP address to the phone, you do not need to enter a value for the DHCP Server option. However, if you are using a DHCP server, this option must have a value. If it does not, check your IP routing and VLAN configuration. Refer to *Troubleshooting Switch Port Problems*, available at this URL:
<http://www.cisco.com/warp/customer/473/53.shtml>
- **IP Address, Subnet Mask, Default Router**—If you have assigned a static IP address to the phone, you must manually enter settings for these options. See the “[Network Configuration Menu](#)” section on page 4-4 for more instructions.

If you are using DHCP, check the IP addresses distributed by your DHCP server. Refer to *Understanding and Troubleshooting DHCP in Catalyst Switch or Enterprise Networks*, available at this URL:

<http://www.cisco.com/warp/customer/473/100.html#41>

Verifying DNS Settings

If you are using DNS to refer to the TFTP server or Cisco CallManager, you must ensure you have specified a DNS server. Verify this setting by pressing the **Settings** button on the phone, choosing **Network Configuration**, and scrolling to the **DNS Server 1** option. You should also verify that there is a CNAME entry in the DNS server for the TFTP server and for the 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 the **Settings** button, choose **Network Configuration**, and look at the **CallManager 1–5** options. The Cisco IP Phone attempts to open a TCP connection to all the Cisco CallManager servers that are part of the assigned Cisco CallManager group. If none of these options contain IP addresses or show “Active” or “Standby,” the phone is not properly registered with Cisco CallManager. See the [“Registering the Phone with Cisco CallManager” section on page 9-4](#) 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 such a situation, it is likely that you are experiencing a system-wide failure, and that other phones and devices are unable to start up properly.

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

To start a service, follow these steps:

Procedure

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- 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.
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Creating a New Configuration File

If you continue to have problems with a particular phone that other suggestions in this chapter do not resolve, the configuration file may be corrupted. To manually create a new configuration file, follow these steps:

Procedure

- Step 1** From Cisco CallManager, choose **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. These files 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.
- Step 5** Rename this file to match the name of the configuration file for the problematic phone. Use the convention *SEPMAC_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 that you created.
- Step 7** Add the phone to Cisco CallManager database. See the [“Adding Phones to the Cisco CallManager Database”](#) section on page 2-5 for details.
- Step 8** Power cycle the phone.
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Symptom: Cisco IP Phone Resets Unexpectedly

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

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

- [Verifying Physical Connection, page 9-8](#)
- [Identifying Intermittent Network Outages, page 9-8](#)
- [Verifying DHCP Settings, page 9-9](#)
- [Checking Static IP Address Settings, page 9-9](#)
- [Verifying Voice VLAN Configuration, page 9-9](#)
- [Verifying that the Phones Have Not Been Intentionally Reset, page 9-10](#)
- [Eliminating DNS or Other Connectivity Errors, page 9-10](#)

Verifying Physical Connection

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

Identifying Intermittent Network Outages

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

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

Verifying DHCP Settings

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

1. Verify that you have properly configured the phone to use DHCP. See the [“Network Configuration Menu” section on page 4-4](#) for more information.
2. Verify that the DHCP server has been set up properly.
3. Verify the DHCP lease duration. Cisco recommends that you set it to 8 days.

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 will be denied, forcing the phone to restart and request a new IP address from the DHCP server.

Checking Static IP Address Settings

If the phone has been assigned a static IP address, verify that you have entered the correct settings. See the [“Network Configuration Menu” section on page 4-4](#) for more information.

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 2-3](#) 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 7970 received a command from Cisco CallManager to reset by pressing the **Settings** button on the phone and choosing **Status > Network Statistics**. If the phone was recently reset one of these messages appears:

- Reset-Reset—Phone closed due to receiving a Reset/Reset from Cisco 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 these steps to eliminate DNS or other connectivity errors:

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- Step 1** Press **Settings > Factory** to reset phone settings to factory defaults. See the “[Resetting Configuration Settings](#)” section on page 4-3 for details.
 - Step 2** Modify DHCP and IP settings.
 - a. Disable DHCP. See the “[Network Configuration Menu](#)” section on page 4-4 for instructions.
 - b. Assign static IP values to the phone. See the “[Network Configuration Menu](#)” section on page 4-4 for instructions. Use the same default router setting used for other functioning Cisco IP Phones.
 - c. Assign TFTP server. See the “[Network Configuration Menu](#)” section on page 4-4 for instructions. 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. Refer to *Configuring The IP Hosts File on a Windows 2000 CallManager Server*, available at this URL:
http://www.cisco.com/warp/customer/788/AVVID/cm_hosts_file.html

- Step 4** From Cisco CallManager, choose **System > Server** and verify that the server is referred to by its IP address and not by its DNS name.
- Step 5** From Cisco CallManager, choose **Device > Phone** and verify that you have assigned the correct MAC address to this Cisco IP Phone. To verify the MAC address on the phone, press the **Settings** button on the phone, choose **Network Configuration**, and scroll to the **MAC address** option.
- Step 6** Power cycle the phone.

General Troubleshooting Tips

[Table 9-1](#) provides general troubleshooting information for the Cisco IP Phone.

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


Summary	Explanation
Moving a network connection from the phone to a workstation.	<p>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> <p></p> <p>Caution The computer's network card cannot receive power through the network connection; if power comes through the connection, the network card can be destroyed. To 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 “Unlocking and Locking Options” section on page 4-2 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.

Table 9-1 Cisco IP Phone Troubleshooting (continued)

Summary	Explanation
Codec mismatch between the phone and another device.	<p>The RxType and the TxType statistics show the codec that is being used for a conversation between this Cisco IP phone and the other device. These values of these statistics should match. If they do not, verify that the other device can handle the codec conversation or that a transcoder is in place to handle the service.</p> <p>See the “Call Statistics Screen” section on page 7-10 for information about displaying these statistics.</p>
Sound sample mismatch between the phone and another device.	<p>The RxSize and the TxSize statistics show the size of the voice packets that is being used a conversation between this Cisco IP phone and the other device. The values of these statistics should match.</p> <p>See the “Call Statistics Screen” section on page 7-10 for information about displaying these statistics.</p>
Gaps in voice calls.	<p>Check the AvgJtr and the MaxJtr statistics. A large variance between these statistics might indicate a problem with jitter on the network or periodic high rates of network activity.</p> <p>See the “Call Statistics Screen” section on page 7-10 for information about displaying these statistics.</p>

Resetting the Cisco IP Phone

There are two methods for resetting the Cisco IP Phone:

- [Performing a Basic Reset, page 9-13](#)
- [Factory Reset, page 9-14](#)

Performing a Basic Reset

When you perform a basic reset of the Cisco IP Phone 7970, any configuration changes that you have made but not saved are lost and reset to their default settings.

To perform a basic reset of the phone, press *****#****.

**Note**

You can use the **Factory** softkey to reset configurable options on the User Preferences Menu, the Network Configuration menu, and the Device Configuration menu to their default settings; reset volume to its default setting; delete call histories from the call logs; and reset the phone. You can use the **Erase** softkey to reset configurable options on the Network Configuration menu to their default values and restart DHCP. See [“Resetting Configuration Settings” section on page 4-3](#) for instructions.

Factory Reset

A factory reset of the Cisco IP Phone restores the phone is reset to its factory state. This procedure reloads the default firmware image, deletes call histories from the call logs, and resets all configuration settings to their factory values.

To perform a factory reset of a phone, perform the following steps. The phone must be on a network that supports DHCP.

Procedure

- Step 1** Unplug the power cable from the phone and then plug it back in.
The phone begins its power up cycle.
- Step 2** While the phone is powering up, and before the Speaker button flashes on and off, press **#**.
Each line button flashes on and off in sequence.
- Step 3** Press **123456789*0#**.
You can press a key twice in a row, but if you press the keys out of sequence, the factory reset will not take place.
After you press these keys, the phone will go through the factory reset process.
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Using the Quality Report Tool

The Quality Report Tool (QRT) is a voice quality and general problem-reporting tool for the Cisco IP Phone 7970. The QRT feature is installed as part of the Cisco CallManager installation.

You can configure users' Cisco IP Phones with QRT. When you do so, users can report problems with phone calls by pressing the **QRT** softkey. This softkey is available only when the Cisco IP Phone is in the Connected, Connected Conference, Connected Transfer, and/or OnHook states.

When a user presses the **QRT** softkey, a list of problem categories appears. The user selects the appropriate problem category and this feedback is logged in an XML file. Actual information logged depends on the user selection and whether the destination device is a Cisco IP Phone.

For more information about using QRT, refer to *Cisco CallManager Serviceability Administration Guide* and *Cisco CallManager Serviceability System Guide*.

Where to Go for More Troubleshooting Information

If you have additional questions about troubleshooting the Cisco IP Phones, several Cisco.com web sites can provide you with more tips.

- Cisco IP Phone Troubleshooting Resources:
http://www.cisco.com/cgi-bin/Support/PSP/psp_view.pl?p=Hardware:IP_Phones&s=Troubleshooting
- Cisco Products and Technologies (Cisco Voice Applications, including Cisco CallManager):
http://www.cisco.com/warp/public/44/jump/voice_applications.shtml
- Cisco Products and Technologies (telephony, including Cisco IP Phones):
<http://www.cisco.com/warp/public/44/jump/telephony.shtml>

Cleaning the Cisco IP Phone

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

Disable the touchscreen before cleaning it so that you will not inadvertently choose a feature from the pressure of the cleaning cloth. To disable the touchscreen so that it will not respond to touch, press the **Display** button for more than one second. The phone displays Touchscreen Disabled and the **Display** button flashes green.

After one minute, the touchscreen automatically re-enables itself. To re-enable the touchscreen before that, press the flashing **Display** button for more than one second. The phone displays Touchscreen Enabled.