CHAPTER 7

Troubleshooting and Maintenance

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

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

This chapter includes these topics:

Resolving Startup Problems

After installing a Cisco Unified IP Phone into your network and adding it to Cisco Unified Communications Manager, the phone should start up as described in the "Verifying the Phone Startup Process" section on page 3-10. If the phone does not start up properly, see the following sections for troubleshooting information:

- Symptom: The Cisco Unified IP Phone Does Not Register with Cisco Unified Communications Manager, page 7-3
- Symptom: Cisco Unified IP Phone Unable to Obtain IP Address, page 7-8

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

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

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

1. Verify that the network port is functional:
   - Exchange the Ethernet cables with cables that you know are functional.
   - Disconnect a functioning Cisco Unified IP Phone from another port and connect it to this network port to verify the port is active.
   - Connect the Cisco Unified IP Phone that will not start up to a different port that is known to be good.
   - Connect the Cisco Unified IP Phone that will not start up directly to the port on the switch, eliminating the patch panel connection in the office.
2. Verify that the phone is receiving power:
   - Verify that the electrical outlet is functional.
   - If you are using in-line power, use the external power supply instead.
   - If you are using the external power supply, switch with a unit that you know to be functional.

If after attempting these solutions, the LCD screen on the Cisco Unified IP Phone does not display any characters after at least five minutes, perform a factory reset of the phone (see the "Where to Go for More Troubleshooting Information" section on page 7-16). If the phone still does not display characters, contact a Cisco technical support representative for additional assistance.

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

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

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

- Identifying Error Messages, page 7-3
- Registering the Phone with Cisco Unified Communications Manager, page 7-4
- Checking Network Connectivity, page 7-4
- Verifying TFTP Server Settings, page 7-4
- Verifying IP Addressing and Routing, page 7-5
- Verifying DNS Settings, page 7-5
- Verifying Cisco Unified Communications Manager Settings, page 7-5
- Cisco Unified Communications Manager and TFTP Services Are Not Running, page 7-6
- Creating a New Configuration File, page 7-6

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

Identifying Error Messages

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

Registering the Phone with Cisco Unified Communications Manager

A Cisco Unified IP Phone can register with a Cisco Unified Communications Manager server only if the phone has been added to the server or if auto-registration is enabled. Review the information and procedures in the "Adding Phones to the Cisco Unified Communications Manager Database" section on page 2-9 to ensure that the phone has been added to the Cisco Unified Communications Manager database.

To verify that the phone is in the Cisco Unified Communications Manager database, choose **Device > Phone > Find** from Cisco Unified Communications Manager Administration to search for the phone based on its MAC Address. For information about determining a MAC address, see the "Determining the MAC Address for a Cisco Unified IP Phone" section on page 2-12.

If the phone is already in the Cisco Unified Communications Manager database, its configuration file may be damaged. See the "Creating a New Configuration File" section on page 7-6 for assistance.

Checking Network Connectivity

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

Verifying TFTP Server Settings

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

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

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

Verifying IP Addressing and Routing

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

On the Cisco Unified IP Phone, press the **OK** button and choose **Settings > Network Configuration > DHCP Enabled.**

- DHCP Enabled—Verify that DHCP Enabled is set to **yes**. If it is not, check your IP routing and VLAN configuration. Refer to *Troubleshooting Switch Port Problems*, available at this URL: http://www.cisco.com/warp/customer/473/53.shtml
- IP Address, Subnet Mask, Default Router—If you have assigned a static IP address to the phone, you must manually enter settings for these options. See the "Configuring Network Settings" section on page 4-3 for instructions.

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

Verifying DNS Settings

If you are using DNS to refer to the TFTP server or to Cisco Unified Communications Manager, you must ensure that you have specified a DNS server. You should also verify that there is a CNAME entry in the DNS server for the TFTP server and for the Cisco Unified Communications Manager system.

Verifying Cisco Unified Communications Manager Settings

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

Cisco Unified Communications Manager and TFTP Services Are Not Running

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

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

To start a service, follow these steps:

Procedure

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

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

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

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

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

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

Creating a New Configuration File

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

To create a new configuration file, follow these steps:

Procedure

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

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

Step 3 Add the phone back to the Cisco Unified Communications Manager database. See the "Adding Phones to the Cisco Unified Communications Manager Database" section on page 2-9 for details.

Step 4 Power cycle the phone:

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

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

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

Note

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

the phone in the Cisco Unified Communications Manager database, but there is no button on the phone with which calls can be answered. These directory numbers should be removed from the phone and deleted if necessary.

Symptom: Cisco Unified IP Phone Unable to Obtain IP Address

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

Make sure that the network or VLAN to which the phone is connected has access to the DHCP server, and make sure that the switch port is enabled.

Cisco Unified IP Phone Resets Unexpectedly

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

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

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

Verifying Physical Connection

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

Identifying Intermittent Network Outages

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

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

Verifying DHCP Settings

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

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

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

Checking Static IP Address Settings

If the phone has been assigned a static IP address, verify that you have entered the correct settings. See the "Configuring Network Settings" section on page 4-3 for more information.

Verifying Voice VLAN Configuration

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

Isolating the phones on a separate auxiliary VLAN increases the quality of the voice traffic.

Verifying that the Phones Have Not Been Intentionally Reset

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

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

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

Eliminating DNS or Other Connectivity Errors

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

Procedure

Step 1 Reset the phone to factory defaults. See the "Resolving Startup Problems" section on page 7-1 for details.

Step 2 Modify DHCP and IP settings:

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

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

c. Assign a TFTP server. See the "Configuring Network Settings" section on page 4-3 for instructions. Use the same TFTP server used for other functioning Cisco Unified IP Phones.

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

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

Step 5 From Cisco Unified Communications Manager, choose **Device > Phone > Find** and verify that you have assigned the correct MAC address to this Cisco Unified IP Phone. For information about determining a MAC address, see the "Determining the MAC Address for a Cisco Unified IP Phone" section on page 2-12.

Step 6 Power cycle the phone:

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

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

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

General Troubleshooting Tips for the Cisco Unified IP Phone

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

Table 7-1 Cisco Unified IP Phone Troubleshooting

Summary	Explanation
Poor quality when calling digital cell phones using the G.729 protocol.	In Cisco Unified Communications Manager, you can configure the network to use the G.729 protocol (the default is G.711). When using G.729, calls between an IP phone and a digital cellular phone will have poor voice quality. Use G.729 only when absolutely necessary.
Prolonged broadcast storms cause IP phones to re-register.	Prolonged broadcast storms (lasting several minutes) on the voice VLAN cause the IP phones to re-register with another Cisco Unified Communications Manager server.

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

Summary	Explanation
Moving a network connection from the phone to a workstation.	If you are powering your phone through the network connection, you must be careful if you decide to unplug the phone's network connection and plug the cable into a desktop computer. **Caution** The computer's network card cannot receive power through the network connection; if power comes through the connection, the network card can be destroyed. To protect a network card, wait 10 seconds or longer after unplugging the cable from the phone before plugging it into a computer. This delay gives the switch enough time to recognize that there is no longer a phone on the line and to stop providing power to the cable.
Changing the telephone configuration.	By default, the network configuration options are locked to prevent users from making changes that could impact their network connectivity. You must unlock the network configuration options before you can configure them. See the "Unlocking and Locking Options" section on page 4-2 for details.
Phone resetting.	The phone resets when it loses contact with the Cisco Unified Communications Manager software. This lost connection can be due to any network connectivity disruption, including cable breaks, switch outages, and switch reboots.
LCD display issues.	If the display appears to have rolling lines or a wavy pattern, it might be interacting with certain types of older fluorescent lights in the building. Moving the phone away from the lights, or replacing the lights, should resolve the problem.
Dual-Tone Multi-Frequency (DTMF) delay.	When you are on a call that requires keypad input, if you press the keys too quickly, some of them might not be recognized.

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

Summary	Explanation
Codec mismatch between the phone and another device.	The RxType and the TxType that is being used for a conversation between this IP phone and the other device should match. If they do not, verify that the other device can handle the codec conversation or that a transcoder is in place to handle the service.
Sound sample mismatch between the phone and another device.	The size of the voice packets that are being used in a conversation between this IP phone and the other device should match.
Gaps in voice calls.	Can be caused by a problem with jitter on the network or periodic high rates of network activity.
Checking signaling.	To check that signaling is working properly between the phone and Cisco Unified Communications Manager, press the **Speaker** button on the phone to answer a call. If you can answer a call and if you hear a dial tone, signaling is working properly.
Checking the handset cradle clip.	Cisco Unified IP Phones are designed with a reversible handset clip in the cradle. This clip is used with the plastic tab protruding out when the phone is in a vertical (wall-mounted) position. The position of the tab can interfere with the handset as it is placed in the cradle. If the phone remains in the on-hook position you may experience continued ringing when you try to answer a call or a lack of dial tone when you try to place a call. To resolve this problem, you may need to reverse the clip. If the handset cradle clip is in the wall-mounted position and your phone is placed on a desktop, slide the clip upward to remove it. Rotate the clip 180 degrees and slide it back in so that the tab is hidden. If the hook switch remains in the down position, tapping on the phone should free up the switch. You can also try pushing and suddenly releasing the off-hook button after the handset has been picked up.

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

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

Resetting or Restoring the Cisco Unified IP Phone

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

- Performing a Basic Reset, page 7-16

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

Performing a Basic Reset

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

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

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

Where to Go for More Troubleshooting Information

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

- Cisco Unified IP Phone Troubleshooting Resources:

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

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

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

Cleaning the Cisco Unified IP Phone

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