



## Maintenance

- [Basic Reset, page 1](#)
- [Voice Quality Monitoring, page 3](#)
- [Voice Quality Reporting, page 5](#)
- [Cisco IP Phone Cleaning, page 6](#)
- [View Phone Information, page 6](#)
- [Reboot Reasons, page 6](#)
- [Phone Behavior During Times of Network Congestion, page 8](#)

## Basic Reset

Performing a basic reset of a Cisco 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.

The following table describes the ways to perform a basic reset. You can reset a phone with any of these operations after the phone has started up. Choose the operation that is appropriate for your situation.

**Table 1: Basic Reset Methods**

Operation	Action	Explanation
Restart phone	Press <b>Settings</b> and choose <b>Admin Settings &gt; Cold Reboot</b> .	Resets any user and network setup changes that you have made, but that the phone has not written to its Flash memory, to previously saved settings, then restarts the phone.
Reset settings	To reset settings, press <b>Settings</b> and choose <b>Admin Settings &gt; Factory Reset</b> .	Restores phone configuration or settings to factory default.

## Perform a Factory Reset with the Phone Keypad

Use these steps to reset the phone to factory default settings using the phone keypad.

### Procedure

---

- Step 1** Unplug the phone:
- If using PoE, unplug the LAN cable.
  - If using the power cube, unplug the power cube.
- Step 2** Wait 5 seconds.
- Step 3** Press and hold # and plug the phone back in.
- Step 4** When the phone boots up, the headset button, the speaker button, and the mute button light up. When the light on the Mute button turns off, press **123456789\*0#** in sequence. When you press **1**, the lights on the headset button turns off. The light on the Select button flashes when a button is pressed.
- After you press these buttons, the phone goes through the factory reset process.
- If you press the buttons out of sequence, the phone powers on normally.
- Caution** Do not power down the phone until it completes the factory reset process, and the main screen appears.
- 

## Perform Factory Reset from Phone Menu

### Procedure

---

- Step 1** Press **Settings**.
- Step 2** Scroll to **Admin Settings** and select **Factory Reset**.
- Step 3** To restore phone configuration or settings to factory default, press **Ok**.
- 

## Factory Reset the Phone from Phone Web Page

You can restore your phone to its original manufacturer settings so that the phone can be reconfigured, do it from the phone web page.

### Procedure

Enter the URL in a supported web browser and click **Confirm Factory Reset**.

You can enter URL in the format:

```
http://<Phone IP>/admin/factory-reset
```

where:

Phone IP = actual IP address of your phone.

/admin = path to access admin page of your phone.

factory-reset = command that you need to enter in the phone web page to factory-reset your phone.

## Identify Phone Issues with a URL in the Phone Web Page

When the phone is not working or doesn't register, a network error or any misconfiguration might be the cause. To identify the cause, add a specific IP address or a domain name to the phone admin page. Then, try to access so that the phone can ping the destination and display the cause.

### Procedure

In a supported web browser, enter a URL that consist of your phone IP address and the destination IP that you want to ping.

Enter a URL in the format:

```
http://<Phone IP>/admin/ping?<ping destination>
```

where:

Phone IP = actual IP address of your phone.

/admin = path to access admin page of your phone.

ping destination = any IP address or domain name that you want to ping. Only alphanumeric characters, '-', and '\_' are allowed as the ping destination. Otherwise the phone shows an error on the web page. If the <ping destination> includes spaces, only the first part of the address is used as the pinging destination. For example, "http://<Phone IP>/admin/ping?192.168.1.1 cisco.com" will actually ping 192.168.1.1.

## Voice Quality Monitoring

To measure the voice quality of calls that are sent and received within the network, Cisco IP Phones use these statistical metrics that are based on concealment events. The DSP plays concealment frames to mask frame loss in the voice packet stream.

- Concealment Ratio metrics: Show the ratio of concealment frames over total speech frames. An interval conceal ratio is calculated every 3 seconds.
- Concealed Second metrics: Show the number of seconds in which the DSP plays concealment frames due to lost frames. A severely "concealed second" is a second in which the DSP plays more than five percent concealment frames.



### Note

Concealment ratio and concealment seconds are primary measurements based on frame loss. A Conceal Ratio of zero indicates that the IP network is delivering frames and packets on time with no loss.

You can access voice quality metrics from the Cisco IP Phone using the Call Statistics screen or remotely by using Streaming Statistics.

## Voice Quality Troubleshooting Tips

When you observe significant and persistent changes to metrics, use the following table for general troubleshooting information.

**Table 2: Changes to Voice Quality Metrics**

Metric Change	Condition
Conceal Ratio and Conceal Seconds increase significantly	Network impairment from packet loss or high jitter.
Conceal Ratio is near or at zero, but the voice quality is poor.	<ul style="list-style-type: none"> <li>Noise or distortion in the audio channel such as echo or audio levels.</li> <li>Tandem calls that undergo multiple encode/decode such as calls to a cellular network or calling card network.</li> <li>Acoustic problems coming from a speakerphone, handsfree cellular phone or wireless headset.</li> </ul> <p>Check packet transmit (TxCnt) and packet receive (RxCnt) counters to verify that voice packets are flowing.</p>
MOS LQK scores decrease significantly	<p>Network impairment from packet loss or high jitter levels:</p> <ul style="list-style-type: none"> <li>Average MOS LQK decreases may indicate widespread and uniform impairment.</li> <li>Individual MOS LQK decreases may indicate bursty impairment.</li> </ul> <p>Cross-check the conceal ratio and conceal seconds for evidence of packet loss and jitter.</p>
MOS LQK scores increase significantly	<ul style="list-style-type: none"> <li>Check to see if the phone is using a different codec than expected (RxType and TxType).</li> <li>Check to see if the MOS LQK version changed after a firmware upgrade.</li> </ul>



**Note**

Voice quality metrics do not account for noise or distortion, only frame loss.

# Voice Quality Reporting

You can capture voice quality metrics for Voice over Internet Protocol (VoIP) sessions with a Session Initiation Protocol (SIP) event package. Voice call quality information derived from RTP and call information from SIP is conveyed from a User Agent (UA) in a session (reporter) to a third party (collector).

The Cisco IP phone uses User Datagram Protocol (UDP) to send a SIP PUBLISH message to a collector server.

## Supported Scenarios for Voice Quality Reporting

Currently, only the basic call scenario supports voice quality reporting. A basic call can be a peer to peer incoming or outgoing call. The phone sends the SIP Publish message when a call ends.

## Mean Opinion Scores and Codecs

The voice quality metrics use Mean Opinion Score (MOS) to rate the quality. A MOS rating of 1 is the lowest quality; a MOS rating of 5 is the highest quality. The following table gives a description of the codecs and MOS scores. For other codecs, the phone does not send the SIP Publish message.

Codec	Complexity and Description	MOS	Minimum Call Duration for Valid MOS Value
G.711 (A-law and u-law)	Very low complexity. Supports uncompressed 64 kbps digitized voice transmission at one to ten 5 ms voice frames-per-packet. This codec provides the highest voice quality and uses the most bandwidth of any of the available codecs.	A minimum value of 4.1 indicates good voice quality.	10 seconds
G.729A	Low to medium complexity.	A minimum value of 3.5 indicates good voice quality.	30 seconds
G.729AB	Contains the same reduced complexity modifications present in the G.729A.	A minimum value of 3.5 indicates good voice quality.	30 seconds

## Configure Voice Quality Reporting

You can enable voice quality reporting on the phone with the web interface. Each extension on a phone has a separate voice quality report. For each extension on the phone, use the corresponding **Voice Quality Report Address** field to configure the generation of voice quality report.

### Procedure

- 
- Step 1** On the Configuration Utility page, select **Admin Login > advanced > Voice > Ext x**.  
Where:
- Ext x = the extension number on the phone
- Step 2** In **SIP Settings**, enter a value in the **Voice Quality Report Address x** field. You can enter either a domain name or an IP address in this field.  
You can also add a port number along with the domain name or an IP address in this field. If you do not enter a port number, the value of the **SIP UDP Port** (5060) is used by default. If the collector server URL parameter is blank, a SIP PUBLISH message is not sent out.
- Step 3** Click **Submit All Changes**.
- 

## Cisco IP Phone Cleaning

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

When the phone is in sleep mode, the screen is blank and the Select button is not lit. When the phone is in this condition, you can clean the screen, as long as you know that the phone will remain asleep until after you finish cleaning.

## View Phone Information

### Procedure

To check the current status of the Cisco IP Phone, click the **Info** tab.

The Info tab shows information about all phone extensions, including phone statistics and the registration status.

## Reboot Reasons

The phone stores the most recent five reasons that the phone was refreshed or rebooted. When the phone is reset to factory defaults, this information is deleted.

The following table describes the reboot and refresh reasons for the Cisco IP Phone.

Reason	Description
Upgrade	The reboot was a result of an upgrade operation (regardless whether the upgrade completed or failed).

Reason	Description
Provisioning	The reboot was the result of changes made to parameter values by using the IP phone screen or phone web user interface, or as a result of synchronization.
SIP Triggered	The reboot was triggered by a SIP request.
RC	The reboot was triggered as a result of remote customization.
User Triggered	The user manually triggered a cold reboot.
IP Changed	The reboot was triggered after the phone IP address changed.

You can view the reboot history as follows:

- From the phone web user interface
- From the IP phone screen
- From the phone Status Dump file (<http://phoneIP/status.xml> or <http://phoneIP/admin/status.xml>)

## Reboot History on the Phone Web User Interface

On the **Info > System Status** page, the **Reboot History** section displays the device reboot history, the five most recent reboot dates and times, and a reason for the reboot. Each field displays the reason for the reboot and a time stamp that indicates when the reboot took place.

For example:

```
Reboot Reason 1: [08/13/14 06:12:38] User Triggered
Reboot Reason 2: [08/10/14 10:30:10] Provisioning
Reboot Reason 3: [08/10/14 10:28:20] Upgrade
```

The reboot history displays in reverse chronological order; the reason for the most recent reboot displays in **Reboot Reason 1**.

## Reboot History on the Cisco IP Phone Screen

**Reboot History** is located under **Apps > Admin Settings > Status** menu. In the Reboot History window, the reboot entries displays in reverse chronological order, similar to the sequence that displays on the phone web user interface.

## Reboot History in the Status Dump File

The reboot history is stored in the Status Dump file ([http://<phone\\_IP\\_address>/admin/status.xml](http://<phone_IP_address>/admin/status.xml)).

In this file, tags **Reboot\_Reason\_1** to **Reboot\_Reason\_3** store the reboot history, as shown in this example:

```
<Reboot_History>
<Reboot_Reason_1>[08/10/14 14:03:43]Provisioning</Reboot_Reason_1>
```

```
<Reboot_Reason_2>[08/10/14 13:58:15]Provisioning</Reboot_Reason_2>  
<Reboot_Reason_3>[08/10/14 12:08:58]Provisioning</Reboot_Reason_3>  
<Reboot_Reason_4>  
<Reboot_Reason_5>  
<Reboot_History/>
```

## Phone Behavior During Times of Network Congestion

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

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

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