Troubleshooting the Cisco 7920 Phone

The following sections describe many of the issues and problems that can arise in a Cisco Wireless IP Telephony network, along with recommended solutions for each issue:

Heat Issues

The Cisco 7920 Wireless IP Phone can get warm at times, but it is well within acceptable temperature levels and meets all compliance regulations. Heat is produced when a call is in progress or if the phone is constantly scanning for new APs in the case of a poor RF signal or at the border of RF coverage. To reduce the amount of heat generated, you can perform the following optimizations:

- Calls in progress

  Lowering the RF output power on the phone will reduce heat but can also affect voice quality. The correct RF setting must be determined on a site-by-site basis.

- Constant scanning for a new APs

  If the phone is constantly going on and off the network or scanning for channels while not associated with an AP, heat will be generated as if the phone is on an active call. In this case, adjust the RF coverage to provide a more stable environment.

Switch Issues

If a Cisco Catalyst 4000 Series Switch is used as the main Layer 3 switch in the network, ensure that it contains, at a minimum, either a Supervisor Engine 2+ (SUP2+) or Supervisor Engine 3 (SUP3) module. The SUP1 or SUP2 module can cause roaming delays.

The Cisco Catalyst 2948G, 2980G, 2980G-A, 4912, and 2948G-GE-TX switches are also known to introduce roaming delays. Cisco does *not* recommend using these switches in a wireless voice network.

DHCP Errors

You can power-cycle the phone to release and renew the phone's Dynamic Host Configuration Protocol (DHCP) settings. The following notes also apply to DHCP:

- Loss of RF will not release the DHCP settings unless a time-out state has been reached.
- Phone firmware version 1.0(5) and later gives precedence to Option 150.
- The phone might associate with the AP but be unable to obtain an IP address from the network. In this case, check the WEP key settings. The phone uses the following process:
  1. Authenticate (WEP or LEAP)
  2. Associate with the AP
  3. Obtain an IP address.
- Ensure that Temporal Key Integrity Protocol (TKIP) and Message Integrity Check (MIC), or Cisco KIP and Cisco MIC, are not enabled for the voice VLAN Service Set Identifier (SSID) on the AP. These features are not supported on the Cisco 7920 Wireless IP Phone.

Phone Firmware Upgrade Failure

All firmware versions after 1.0(6) have mechanisms in place to prevent the firmware from getting corrupted and the phone from being unable to boot successfully. Firmware can be upgraded via TFTP from Cisco CallManager or via USB through the Cisco 7920 Configuration Utility.

If there is a failure or power is lost during an upgrade, you will have to use the Configuration Utility to recover the phone. Perform the following steps in this scenario

1. Boot the phone while holding down the power key, **END(!)**, and **#** at the same time. You will be prompted for a USB connection.
2. The Configuration Utility will prompt you to browse to the phone firmware on the PC. The latest firmware can be downloaded from the Software Center on Cisco.com.

Phone Firmware Downgrades after Cisco CallManager Upgrade or Patch

If a Cisco CallManager patch is applied that is older than the current running firmware, the phones might automatically downgrade to the load contained in the patch. Check 7920 device default image in Cisco CallManager and the OS7920.txt file in the TFTP folder to fix this issue.

Active and Standby

The Cisco 7920 Wireless IP Phone can be in either active and standby mode. Active mode occurs when there is an active call or a scheduled event to send Cisco Discovery Protocol (CDP) or keep-alive packets. To maximize battery life and talk time, the Cisco 7920 Wireless IP Phone goes into standby mode after a minute or so of idle time in a stable RF environment. The phone enters standby mode every 2 seconds after an active scan is completed. The phone will not enter standby mode with an active RTP stream. The following events also cause the phone to awake from standby mode:

- Key activity
- Roaming
- Power cycling
- Loss of network connectivity
- Loss of RF connectivity
- Scheduled CDP or keep-alive packets

If a phone is in an unstable RF environment, it will remain in active mode and scan constantly.

Battery Life

The following types of batteries are available for the Cisco 7920 Wireless IP Phone:

- Standard 1560 mA lithium ion, with an average battery life of 3.5 hours talk-time or 21 hours standby
- Extended 1960 mA lithium ion, with an average battery life of 4.25 hours talk-time or 30 hours standby

Active call time will reduce the standby time.

Consider the following points with regard to battery life:

- An unstable RF environment affects battery life. If the phone is never able to enter standby mode because of continuous roaming or scanning, battery life will be greatly reduced. When leaving an area of coverage, shut down the phone to preserve battery life.
- Vibrate mode can reduce battery life.
- The background light should not affect battery life.
- Lithium ion batteries do not exhibit memory effects. Partial charges decrease the talk time for that charge but do not damage the battery.
- Batteries stop charging once they are fully charged. It is acceptable to leave batteries in the charger for extended periods of time.
- Batteries should be able to handle over 4000 recharges.
- Higher phone transmit power also affects battery life.

Configuration Utility Issues

Consider the following points when using the Cisco 7920 Configuration Utility:

- USB must be enabled on the Cisco 7920 Wireless IP Phone for it to be recognized by Microsoft Windows. You can enable USB through the keypad by selecting **Menu > Phone Settings > USB Enable/Disable**.
- Do not assign a static address to the network interface called Cisco 7920 USB. It will receive an IP address automatically from the Cisco 7920 Configuration Utility. Static addressing can cause the utility to fail.
- You must select a ring tone when configuring the phone via the Configuration Utility, otherwise the phone will have no ring tone until one is configured manually.
- If using the 192.168.1.x network for the PC where you are running the Configuration Utility, disable the Ethernet interface when using the Configuration Utility because it could cause a conflict with the USB interface for configuring the phones.

Note Ensure that USB is disabled on the phone after using the Configuration Utility; leaving it enabled could cause IP network connectivity issues.

Common Roaming Issues

The following roaming issues can occur with the Cisco 7920 phone:

- Phone does not roam when placed directly under AP
  - Phone is most likely not reaching the roaming differential thresholds for the received signal strength indicator (RSSI) and channel utilization (CU). Adjust the power settings on the APs.
  - Phone is not receiving beacons or probe responses from AP.
- Phone roams too slowly
  - Make sure the Cisco 7920 Wireless IP Phone has another acceptable AP as a roaming option in the phone's site survey. The next AP ideally should have an RSSI value of 35 or higher for roaming.
  - Check the Cisco Catalyst 4000 Series Switch. Supervisor Engine 2 (SUP2) modules can cause significant delays; upgrade to SUP2+ or SUP3 instead.
- Phone loses connection to Cisco CallManager when roaming
  - Check authentication for a possible WEP mismatch.
  - The phone is capable of seamless Layer 2 roaming only (unless WLSM is configured), so ensure that the new AP is not serving a different IP subnet.
  - If using LEAP, check that TCP ports are not blocked by filters on the AP. Port 1645 is used for the Access Control Server (ACS), and port 1812 is used for other RADIUS servers.
  - Verify that the associated AP has IP connectivity to Cisco CallManager.
  - Check RF signal strength.

- Phone looses voice quality while roaming
  - Check for low RSSI on the destination AP.
  - Channel overlap might be insufficient. The phone must have time to hand off the call smoothly before it loses its signal with the original AP.
  - The signal from the original AP might be lost.

Audio Problems

There are a few common configuration errors that can cause some easily resolved audio issues. If possible, check audio problems against a wired phone to help narrow the problem to a wireless issue. Common audio problems include:

- No audio
  - A common reason for no audio is that TKIP and/or MIC are configured on the AP. These features are not yet available for the Cisco 7920 Wireless IP Phone and can cause audio issues if enabled.
- One-sided audio
  - This problem can occur in the fringe areas of an AP, where a signal might be too weak on either the phone side or the AP side. Matching the power settings on the phone and the AP, when possible, can fix this problem. This problem is most common when the variation between the AP setting and the phone setting is large (for example, 100 mW on the AP and 20 mW on the phone).
  - Check the gateway and IP routing for voice quality.
  - Check to see if a firewall or NAT is in the path of the RTP packets. By default, firewalls and NATs cause one-way audio or no audio. Cisco IOS and PIX NATs and firewalls have the ability to modify those connections so that two-way audio can flow.
  - One-way audio can occur if ARP caching is not configured on the AP. Refer to the section on AP Configuration (for Installation), page 7-2, for information on how to set this feature.
- Data rate settings
  - If there is a specific data rate set on the phone or AP, then they must match or the phone must be set to its default of automatic.
- Hardware issues
  - To make sure the speaker is functioning properly, first check the volume settings under the selected profile, then enable keypad tones to check the speaker.
  - For additional speaker issues, refer to Field Notice 29257, available at

    http://www-tac.cisco.com/Support_Library/field_alerts/fn29257.html
- Ring volume too low
  - Louder ring tones (such as loudlaser.raw) are available on Cisco.com. Loud ring tone must be downloaded via TFTP with Cisco CallManager and not with the Configuration Utility.

Registration and Authentication Problems

When encountering problems with authentication, perform the following checks:

- Check SSIDs to make sure they match on the phone and the AP (or network). Also be sure the network has a route to Cisco CallManager.
- Check the WEP keys to make sure they match. It is a good idea to re-enter them on the Cisco 7920 Wireless IP Phone because it is quite easy to make a typing error when entering a WEP key or password.

The following messages or symptoms can occur:

- Registration Rejected

  This error is most likely a Cisco CallManager issue. You will either have to manually configure the phone in Cisco CallManager or enable auto-registration.

- Cisco Wireless IP Phone 7920 shows up as Cisco IP Phone 7960 in Cisco CallManager

  Prior to Cisco CallManager Release 3.3(3) SR1, the phone device ID is shown as 7960. To correct this issue, upgrade the Cisco CallManager software and delete and reconfigure the phones as 7920s.

- Cannot support all Requested Capabilities

  The most likely cause of this error is that TKIP and/or MIC is configured on the associated AP on the voice VLAN. Remove these settings because this functionality is not yet supported on the Cisco 7920 Wireless IP Phone.

- Authentication Failed, No AP found
  - Cisco Centralized Key Management (Cisco CKM) and Cipher suites might be enabled. These features are not supported.
  - Check WEP keys or LEAP username and passwords.

- No service, IPconfig Failed

  This is usually a problem with the connection to the DHCP server. Make sure the phone is able to receive an IP address. Also check encryption.

- Cisco CallManager shows up as TFTP_AS_CM in the current phone configuration

  This error indicates the phone is attempting to connect to the TFTP server but is not getting the correct TFTP responses.

- LEAP Password Prompt

  The setup configuration for some AAA servers might require a fully qualified username if integrated with a Microsoft Windows server. If so, you might have to enter the LEAP username in the format

  domain/username

Non-Cisco Access Points

Cisco 7920 Wireless IP Phones are supported only with Cisco APs, but they will work with any Wi-Fi compliant AP. The following functions are still available with non-Cisco APs:

- Roaming
- Static WEP
- Upstream wireless QoS (7920-to-AP) via lower CWmin and CWmax

The following functions are *not* available with non-Cisco APs that are not Wi-Fi compliant:

- LEAP
- Downstream QoS (two queues)
- QoS Basis Service Set (QBSS) load
- Cisco Discovery Protocol (CDP)
- Dynamic Transmit Power Control (DTPC)

Clock Issues

Occasionally the time or date is incorrect on the phone even though it is correct on Cisco CallManager. Because the Cisco 7920 Wireless IP Phone updates its time and date when it uses TFTP to download its configuration, resetting or power-cycling the phone will correct this problem

VxWorks-to-IOS Conversion

The QoS contention window values might not be set to the standard default settings after a migration from VxWorks to Cisco IOS. Make sure Cisco IOS defaults are configured on the newly migrated AP. (Figure 7-7 shows these default values.) In addition, a number of settings have been known to get corrupted during use of the automated conversion migration tool. Cisco highly recommends that you reset the AP to factory defaults after the conversion and begin all configurations from the factory defaults.