Release Notes for Cisco Wireless LAN Controllers and Mesh Access Points for Release 4.2.207.54M

April, 2010

These release notes describe features, enhancements, and caveats in release 4.2.207.54M. This maintenance release supports Cisco 1500 (1505 and 1510) series outdoor mesh access points on the controller mainline release base.

Note Before installing this software, refer to the "System Requirements" section on page 3 for details on compatibility with Cisco Wireless LAN Controllers (controllers), Cisco Wireless Control Systems (WCS), and access points.

Contents

These release notes contain the following sections:

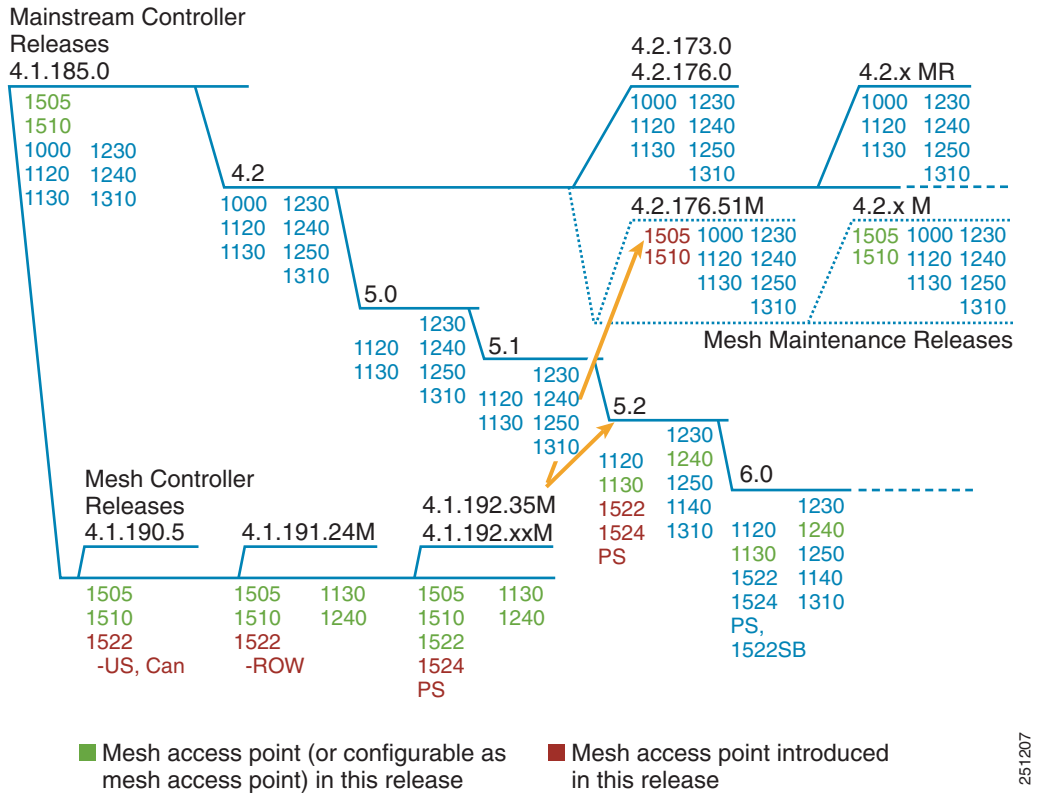
Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Overview

Release 4.2.207.54M provides support for Cisco 1500 (1505 and 1510) series outdoor mesh access points on the controller mainline release base (see Figure 1). The 1505 and 1510 **will not** be supported on any controller release beyond 4.2.

You can upgrade to this release from mesh release 4.1.192.35M.

Figure 1 Controller Mainstream and Mesh Releases



Note Depending on the customer's feature requirements, customers operating with both Cisco1500 series (1505, 1510) and 1520 (1522, 1524) series mesh access points in their network might need to use two separate controllers in the network (one for the 1500 series, and one for the 1520 series). For detailed interoperability guidelines between 1500 series and 1520 series mesh access point and other access points, refer to *Cisco Aironet 1500 and 1520 Series Access Points Software Release Guidelines* at http://www.cisco.com/en/US/prod/collateral/wireless/ps5679/ps6548/bulletin_c78-542046.html

Release 4.2.207.54M is supported on the following Cisco Wireless LAN controller platforms:

- 2106 series, 4400 series, and Wireless Service Module (WiSM) for the Catalyst 6500 and 7600.

Release 4.2.207.54M is compatible with Cisco WCS release 6.x, 5.2.148, and 4.2.128.0.

Release 4.2.207.54M is compatible with the following indoor and outdoor access points:

- Cisco Aironet 1500 (1505 and 1510) series outdoor mesh access points
- Cisco Aironet 1000, 1100, 1130, 1140, 1200, 1240, 1250, and 1310 indoor access points.

Note Release 4.2.207.54M does not support Cisco 1520 (1522, 1524) series mesh access points. Cisco 1520 series mesh access points are supported in release 5.2 (and later) of the controller mainline release.

Note Enterprise mesh is not supported in 4.2.207.54M.

Note The 1140 and 1250 series access points have a hardware limitation where beacons can only be output at intervals that are multiples of 17 milliseconds. When these APs are configured for a 100-millisecond beacon interval, they transmit beacons every 102 milliseconds. Similarly, when the beacon interval is configured for 20 millieconds, these APs transmit beacons every 17 milliseconds.

Note Refer to the *Cisco Aironet 1500 Series Outdoor Mesh Access Point Hardware Installation Guide* and *Getting Started Guide* for details on the physical installation and initial configuration of the mesh access points at: http://www.cisco.com/en/US/products/ps6548/prod_installation_guides_list.html

Note Refer to "Monitoring Wireless Devices" (Chapter 6) in the *Cisco Wireless Control System Configuration Guide, Release 6.0* for details on monitoring the mesh network (access points, links, statistics, alarms) at: http://www.cisco.com/en/US/docs/wireless/wcs/6.0/configuration/guide/6_0mon.html

System Requirements

Caution You can downgrade from 4.2.207.54M to release 4.1.192.35M. You cannot downgrade to any other mesh release (4.1.190.5, 4.1.191.24M, or 4.1.192.22M).

Caution A downgrade to any previous release resets the controller to the factory default configuration.

Software Images

Table 1 lists the names of the images associated with this release.

Table 1 Software Images Associated with Release 4.2.207.54M

Products	4.2.207.54M and Related Software Images	
Access Point		
	1000	c1000-k9w8-mx.124-10b.JDA1
	1100	c1100-k9w8-mx.124-10b.JDA1

Table 1 Software Images Associated with Release 4.2.207.54M

Products	4.2.207.54M and Related Software Images	
	1130	c1130-k9w8-mx.124-10b.JDA1
	1200	c1200-k9w8-mx.124-10b.JDA1
	1240	c1240-k9w8-mx.124-10b.JDA1
	1250	c1250-k9w8-mx.124-10b.JDA1
	1310	c1310-k9w8-mx.124-10b.JDA1
	1505	VxWorks_5312
	1510	VxWorks_5312
WLC-4400	AIR-WLC4400-K9-4-2-176-51M-MESH.aes	
WLC-2100	AIR-WLC2100-K9-4-2-176-51M-MESH.aes	
WiSM	AIR-WLC4400-K9-4-2-176-51M-MESH.aes **Note** The Catalyst 6500 Supervisor 720 image is s72033_rp-ADVENTERPRISEK9_DBG-M	
Cisco WCS	Release 6.x Release 5.2.148 Release 4.2.128.0	
Cisco WCS Navigator	NAVIGATOR-K9-1.5.132.exe NAVIGATOR-K9-1.4.148.exe NAVIGATOR-K9-1.1.128.exe	

Upgrading to this Software Release

For instructions on downloading software to the controller using Cisco WCS, refer to the release 6.0 version of the *Cisco Wireless Control System Configuration Guide* at the following link:

http://www.cisco.com/en/US/products/ps6305/products_installation_and_configuration_guides_list.html

For instructions on downloading mesh release 4.2.207.54M software to the controller using the controller GUI or CLI, refer to Software Upgrade Procedure, page 11.

Upgrade Compatibility Matrix

Table 2 outlines the upgrade compatibility of controller mesh and non-mesh releases and indicates the intermediate software releases required as part of the upgrade path.

Note Upgrading directly from release 4.1.192.35M to release 4.2.207.54M resets the controller to factory defaults. You should first upgrade from release 4.1.192.35M to 4.2.176.51M and then to 4.2.207.54M.

Table 2 Upgrade Compatibility Matrix for Controller Mesh and Non-Mesh Releases

Upgrade from \ Upgrade to	4.2.207.54M	4.2.176.51M	4.1.192.35M	4.1.191.24M	4.1.190.5	4.1.185.0	4.1.171.0	4.0.219.0	4.0.217.204	4.0.217.0	4.0.216.0	4.0.206.0	4.0.179.11	4.0.179.8	4.0.155.5	4.0.155.0	3.2.195.10	3.2.193.5	3.2.171.6	3.2.171.5	3.2.150.10	3.2.150.6	3.2.116.21	3.2.78.0	3.1.111.0	3.1.105.0	3.1.59.24
4.1.192.35M	Y[1]	Y[2]																									
4.1.192.22M	–		Y	–																							
4.1.191.24M	–		Y	–																							
4.1.190.5	–		Y[3]	Y	–																						
4.1.185.0				Y	Y[4]	–																					
4.1.181.0					Y[2]	Y[2]																					
4.1.171.0					Y[2]	Y[2]	–																				
4.0.219.0						Y[2]	Y[2]	–																			
4.0.217.204				Y[2]		Y[2]	Y[2]	Y[2]	–																		
4.0.217.0						Y[2]	Y[2]	Y[2]	Y[5]	–																	
4.0.216.0						Y[2]	Y[2]	Y[2]	Y[3]	Y	–																
4.0.206.0						Y[2]	Y[2]	Y[2]	Y[3]	Y		–															
4.0.179.11										Y		Y[6]	–														
4.0.179.8										Y		Y[4]	Y	–													
4.0.155.5										Y		Y[4]	Y	Y	–												
4.0.155.0										Y		Y[4]	Y	Y	Y	–											
3.2.195.10										Y		Y[4]	Y	Y	Y		–										
3.2.193.5										Y		Y[4]	Y	Y	Y		Y	–									
3.2.171.6										Y		Y[4]	Y	Y	Y		Y		–								
3.2.171.5										Y		Y[4]	Y	Y	Y		Y		Y	–							
3.2.150.10										Y		Y[4]	Y	Y	Y		Y		Y		–						
3.2.150.6										Y		Y[4]	Y	Y	Y		Y		Y		Y	–					
3.2.116.21										Y		Y[4]	Y	Y	Y		Y		Y		Y		–				
3.2.78.0										Y		Y[4]	Y	Y	Y		Y		Y		Y		Y	–			
3.1.111.0																	Y		Y		Y		Y	Y	–		
3.1.105.0																	Y		Y		Y		Y	Y	Y	–	
3.1.59.24																	Y		Y		Y		Y	Y	Y	Y	–

1. Upgrading directly from release 4.1.192.35M to release 4.2.207.54M resets the controller to factory defaults. You should first upgrade from 4.1.192.35M to 4.2.176.51M and then to 4.2.207.54M.
2. You must be at release 4.1.192.35M to upgrade to release 4.2.176.51M.
3. You can upgrade directly from 4.1.190.5 to 4.1.192.35M; however, upgrading to 4.1.191.24M before upgrading to 4.1.192.35M is highly recommended.
4. Dynamic frequency selection (DFS) is not supported.
5. Release 4.0.217.204 provides fixes for DFS on the 1510. This functionality is only needed in countries where DFS rules apply.

6. An upgrade to 4.0.206.0 is not allowed in the following Country Codes when operating with the following access points: Australia (AP1505 and 1510), Brazil (AP1505 and AP1510), Hong Kong (1505 and 1510), India (1505 and 1510), Japan (1510), Korea (1505 and 1510), Mexico (1505 and AP1510), New Zealand (1505 and 1510), and Russia (1505 and 1510).

Important Notes

This section describes information about new hardware and software features, and operational notes for release 4.2.207.54M.

Note Release 4.2.207.54M provides wireless mesh features that are not found in other mainline 4.2.x controller releases. Mesh features are also found for the 1520 series in the main controller release 5.2 and later.

Note Release 4.2.207.54M supports the features of 4.2.176.0 (non-mesh controller release). Refer to: http://www.cisco.com/en/US/docs/wireless/controller/release/notes/crn421760.html

Hardware Features

Access Point Support

Release 4.2.207.54M is compatible with the following indoor and outdoor access points:

- Cisco Aironet 1500 (1505 and 1510) series outdoor mesh access points
- Cisco Aironet 1000, 1100, 1130, 1140, 1200, 1240, 1250, and 1310 indoor access points

Note Release 4.2.176.35M does **not** support Cisco 1520 (1522, 1524) series mesh access points.

RAP vs. MAP Functionality

Access points within a mesh network operate as either a root access point (RAP) or mesh access point (MAP).

Outdoor mesh access points (1505, and 1510) can function as either RAPs or MAPs. By default, all outdoor mesh access points are shipped as MAPs and must be configured to function as a RAP.

At least one access point within a mesh network must be configured to function as a RAP.

RAPs within the network have a wired connection to the controller, and MAPs communicate among themselves and back to the RAP using wireless connections over the backhaul. MAPs use the AWPP protocol to determine the best path through the other mesh access points to the controller.

All the possible paths between the MAPs and RAPs form the wireless mesh that is used to carry traffic from wireless LAN clients connected to MAPs and to carry traffic from devices connected to MAP Ethernet ports.

Software Features and Enhancements

The following software features and enhancements are supported in release 4.2.207.54M.

Note Enterprise mesh is not supported in 4.2.207.54M.

1505 and 1510 Support

Release 4.2.207.54M supports Cisco 1500 (1505 and 1510) Series Outdoor Mesh Access Point.This release is the only 4.2 mainstream controller release that supports the 1505 and 1510.

Continued Feature Support

A summary of previously released mesh software features supported by 1505 and 1510 outdoor mesh access points is provided in Table 3.

Table 3 Mesh Access Point Feature Support Matrix for 4.2.207.54M

Feature/Platform	1505	1510
Mesh Network Functionality		
Passive scanning–Access point searches for an alternative parent on its current backhaul.	X	X
Background Scanning–Access point searches for an alternative parent on any possible backhaul channel.	X	X
Optimal Parent Selection–Access point joins the best available parent.	X	X
Exclusion Listing–Access point avoids selecting as parent those access points which have a pattern of failing.	X	X
Radar-free Coordinated Sector–Access point notifies parent when radar is detected on the channel so an alternative channel can be employed by the sector.	X	X
Dynamic Frequency Selection–Alternative channel is selected when radar is detected in regulated bands.	–	X
Synchronized Channel Change–Parent advises children of intended channel change.	X	X
Reliable Link Layer, Extended Retries–Transmissions that do not succeed will extend the number of retry attempts in an effort to improve reliability.	_	X

Table 3 Mesh Access Point Feature Support Matrix for 4.2.207.54M (continued)

Feature/Platform	1505	1510
Reliable Link Layer, Secondary Backhaul Radio–A secondary backhaul radio is used as a temporary path for traffic that cannot be sent on the primary backhaul because of intermittent interference.	–	X
Passive Beaconing–Log messages from an access point that cannot connect are relayed through other access points to the controller.	X	X
Network Services Functionality		
Ethernet Bridging–Traffic is bridged from hosts connected to a wired port.	X	X
Containment of Bridged Multicast Traffic–There are two types of multicast traffic, bridged and LWAPP, and each is governed by a different mechanism. LWAPP multicast is managed by the LWAPP methods at the controller, and bridged multicast is governed by the multicast network settings. Multicast flows (such as video camera broadcasts) originating in the network from a MAP Ethernet port terminate only at the RAP Ethernet (In mode Multicast). In this mode, multicast flows are not transmitted throughout the mesh network, thereby reducing bandwidth requirements.	X	X
Universal Access–Radio used for backhaul traffic provides access for client traffic. **Note** This feature is only configurable on the 1510. On the 1505, this feature is always enabled because the 1505 only supports one radio (802.11b/g).	X	X
Support for Workgroup Bridges–Allows multiple wired hosts to connect to the wireless network through a workgroup bridge.	X	X
Multiple Queues for Backhaul Traffic–Extends client traffic prioritization to the backhaul traffic.	X	X

Table 3 Mesh Access Point Feature Support Matrix for 4.2.207.54M (continued)

Feature/Platform	1505	1510
Static Call Admission Control (CAC)–Ensures sufficient bandwidth is available in a mesh sector before serving new T-SPEC client call requests. **Note** Static CAC is not fully supported. Static CAC functions as expected; however, there is no way to verify static CAC parameters on the controller using CLI or the GUI (CSCta46421, CSCsz82878).	–	X
Mesh Security		
EAP Authentication–Restricts mesh node access to approved, authenticated access points. EAP-FAST authentication provides secure authentication and encryption key management.	X	X
Applications		
High-speed Roaming–Roam speeds of up to 70 mph are supported for Cisco Compatible Extension (CX) v4 clients.	–	X

Operational Notes

This section describes information about important operational notes and changes to existing controller CLI and GUI for release 4.2.207.54M.

Unable to Verify Static Call Admission Control (CAC) Parameters

Static CAC functions as expected; however, there is no way to verify static CAC parameters on the controller (CSCta46421, CSCsz82878) using the controller CLI or GUI.

Access Point Support Limit on WiSMs

The WiSM only supports up to 300 mesh access points reliably. Therefore, do not allow more than 300 mesh access points to associate with a WiSM.

Configuration Database Setting of 2048 Recommended for Large Mesh Deployments

In large mesh deployments, increasing the configuration database setting to 2048 is highly recommended. The configuration database total includes MAC filter entries, access point MIC and SSC entries, dynamic interfaces, management users, and local net users. You can increase the configuration database to 2048 using the **config database size 2048** command and in the controller GUI, at the Security > AAA > General window (CSCsg88704).

Bridge MAC Filter Config Status Shown in Error

The **show network summary** command mistakenly displays a status for the Bridge MAC Filter Config parameter. This parameter is not a configurable option in release 4.2.207.54M (CSCsk40572).

Limit Bridge Group Names to 11 Characters

Entering more than 11 characters into the bridge group name (BGN) field in the controller GUI mesh access point configuration window (Wireless > All APs > *AP-Name* > *Mesh*) generates an error message. This is also true when assigning bridge group names for mesh access points using Cisco WCS (Configure > Access Points > *AP_name*) and the **config ap bridgegroupname set groupname** *Cisco_MAP* command (CSCsk64812).

In Cisco WCS, port status in found on the Interfaces tab of the access point page (Monitor > Access Points > *AP Name).*

Battery Charge Information is not Available for 1510s with Power Supply 1.01d Firmware

A1510 with an *Alpha FlexNet MPS30-48C-SL* power supply must have firmware version 1.02d or greater to supply information about its remaining charge to the controller and Cisco WCS. Otherwise, the controller and WCS display incorrect battery information.

To upgrade your power supply to 1.02d (or greater) firmware, return the power supply to an Alpha service center (Argus).

To arrange return of power supply call or email:

Phone: US and Canada: 1 888 GO ARGUS (462-7487), International: 1 604 436 5547

Email: support@argusdcpower.com

For additional Alpha service centers, see their website.

Probing of Battery Charge Levels for 1510 Requires Allowance for Cycles

After detaching and reattaching a probe to a backup battery on a 1510 mesh access point, the battery status remains at a 0% charge reading for up to 30 minutes. This is in keeping with the design of the battery. The battery estimates its charge on 30 minute cycles (CSCsi83272).

Warning Message Added for AP Bridging Disable Requests

When a request is made to disable access point bridging using either the controller GUI (All APs > *AP_Name* > Mesh) or CLI (**config ap bridging disable**), the following message is displayed (CSCsi88127,CSCsm16458):

Disabling ethernet bridging will affect servicing of ethernet bridged clients.

Are you sure you want to continue?

LinkTest Limitations Message Added

The following warning message appears in the controller GUI (Wireless > All APs > *Access Point Name* > *Neighbor Info*) and CLI (**config mesh linktest**) when you run a linktest that might oversubscribe the link (CSCsm11349).

Warning! Data Rate (100 Mb/s) is not enough to perform this link test on packet size (2000bytes) and (1000) packets per second. This may cause AP to disconnect or reboot. Are you sure you want to continue?

Software Upgrade Procedure

When you upgrade the controller's software, the software on the controller's associated access points is also automatically upgraded.

Caution Do not power down the controller or any access point during this process; otherwise, you might corrupt the software image. Upgrading a controller with a large number of access points can take as long as 30 minutes, depending on the size of your network. The access points must remain powered, and the controller must not be reset during this time.

Caution Controller software releases 4.2.207.54M is greater than 32 MB; therefore, you must verify that your TFTP server supports files this size. Two TFTP servers that support files of this size are *tftpd* and the TFTP server within the WCS. If you download the 4.2.207.54M mesh software and your TFTP server does not support greater than 32 MB file size, the following error message appears: "TFTP failure while storing in flash."

Caution Refer to the "Upgrade Compatibility Matrix" section on page 4 to verify the upgrade path to this release before starting any software upgrade.

Note When upgrading to an intermediate software release as part of the 4.2.207.54M controller software upgrade, ensure that all access points associated with the controller are at the same intermediate release before preceding to install the next intermediate or final version of software. In large networks, it can take some time to download the software on each access point.

Note Upgrading directly from release 4.1.192.35M to release 4.2.207.54M resets the controller to factory defaults. You should first upgrade from release 4.1.192.35M to 4.2.176.51M and then to 4.2.207.54M.

Caution A backup of your controller configuration file is recommended prior to any software upgrade. Without this backup, you will need to manually reconfigure the controller should the configuration file be lost or corrupted or you need to downgrade.

Follow these steps to upgrade the mesh controller software using the controller GUI.

Step 1 Upload your controller configuration files to a backup server.

Step 2 Follow these steps to obtain the mesh controller software and the associated boot images from the Software Center on Cisco.com:

a. Click this URL to go to the Software Center:

   http://www.cisco.com/cisco/software/navigator.html

b. Click **Wireless Software**.

c. Click **Wireless LAN Controllers**.

d. Click **Standalone Controllers, Wireless Integrated Routers,** or **Wireless Integrated Switches**.

e. Click the controller product name.

f. Click **Mesh Controller Software**.

g. Click a controller software release.

Note Verify that the software release is 4.2.207.54M and is for Mesh Networks. Do not download any version that is not noted as a mesh release.

h. Click the filename (*filename*.aes).

Note Refer to the"Software Images" section on page 3 for image filenames associated with this release.

i. Click **Download**.

j. Read Cisco's End User Software License Agreement and then click **Agree**.

k. Save the file to your hard drive.

l. Repeat steps a. to k. to download the boot image file.

Step 3 Copy the controller software file (*filename*.aes) and the boot image to the default directory on your TFTP server.

Step 4 Click **Commands** > **Download File** to open the Download File to Controller page.

Step 5 From the File Type drop-down box, choose **Code**.

Step 6 In the IP Address field, enter the IP address of the TFTP server.

Step 7 The default values of 10 retries and 6 seconds for the Maximum Retries and Timeout fields should work without any adjustment. However, you can change these values. To do so, enter the maximum number of times that the TFTP server attempts to download the software in the Maximum Retries field and the amount of time (in seconds) that the TFTP server attempts to download the software in the Timeout field.

Step 8 In the File Path field, enter the directory path of the controller software.

Step 9 In the File Name field, enter the name of the software file (*filename*.aes).

Step 10 Click **Download** to download the software to the controller. A message appears indicating the status of the download.

Step 11 Repeat Step 6 to Step 12 to install the controller boot image.

Step 12 Disable any WLANs on the controller.

Step 13 After the download is complete, click Reboot.

Step 14 If prompted to save your changes, click **Save and Reboot**.

Step 15 Click **OK** to confirm your decision to reboot the controller.

Step 16 After the controller reboots, re-enable the WLANs.

Step 17 If desired, reload your latest configuration file to the controller.

Step 18 To verify that the 4.2.207.54M controller software is installed on your controller, click **Monitor** on the controller GUI and look at the Software Version field under Controller Summary.

Caveats

The following sections list Open Caveats and Resolved Caveats in release 4.2.207.54M. For your convenience in locating caveats in Cisco's Bug Toolkit, the caveat titles listed in this section are drawn directly from the Bug Toolkit database. These caveat titles are not intended to be read as complete sentences because the title field length is limited. In the caveat titles, some truncation of wording or punctuation might be necessary to provide the most complete and concise description. The only modifications made to these titles are as follows:

- Commands are in **boldface** type.
- Product names and acronyms may be standardized.
- Spelling errors and typos may be corrected.

Note If you are a registered cisco.com user, view Bug Toolkit on cisco.com at the following website:

http://tools.cisco.com/Support/BugToolKit/

To become a registered cisco.com user, go to the following website:

http://tools.cisco.com/RPF/register/register.do

Open Caveats

The following caveats are open (unresolved) in this release:

Table 4 Open Caveats

ID Number	Caveat Title
CSCsx41062	WLC rejects apparently valid NTP packets
CSCsx50408	LWAP DOS Attack trap message does not record the source MAC address
CSCsy06464	H-REAP AP obtains IP via DHCP on wrong interface
CSCsy62007	When client is on DHCP req, WLC will drop DHCP Inform packet
CSCsz19203	Controller crashes at "SSHpmMainTask"
CSCtb94670	WLC outputs Decrypt errors traplog at client reauth timing
CSCte92886	4.2 Mesh controller Memory Leak in EAP Framework
CSCtf53344	LWAP DOS Attack trap message does not record the source MAC address
CSCtf96363	Upgrade from R3 (4.1.192.35M) to D3MR5 (4.2.207.54M) resets the wlc to factory default

Resolved Caveats

The following caveats are resolved in 4.2.207.54M.

Table 5 Resolved Caveats

ID Number	Caveat Title
CSCsv13068	Web Authentication Access-Request has Authenticator set to all zeros
CSCsz26858	WLC crash Task Name: dot11b (usmDbSnmpRrmProfileFailureTrapSend)
CSCsz92765	1510 Mesh AP "Unable to transmit mesh adjacency frame
CSCta20270	Battery Input Voltage not listed in CLI
CSCta20292	Battery Charge concatenated with "BatteryCurrent
CSCta25693	In mesh 4.2.130.193 cLApEthernetIfTable OID returns zero values
CSCta26112	1510 RAP corrupting JOIN reply from all controllers to all MAPs
CSCta60047	wlc unable to tftp 4.2.176.51M Error while writing output
CSCtb31111	Memory Leak in EAP framework task
CSCtb38474	5GHz radio in 1020AP doesn't work in 4.2.176.51M (Mesh)
CSCtb52143	4.2 Mesh controller crash on task name mfpKeyRefreshTask
CSCtc46175	Controller crash SNMPTask when doing backhaul linktest
CSCtc91431	ReadOnly local management user can change H-REAP VLAN mapping
CSCte92886	4.2 Mesh controller Memory Leak in EAP Framework

If You Need More Information

If you need information about a specific caveat that does not appear in these release notes, you can use the Cisco Bug Toolkit to find caveats of any severity. Click this URL to browse to the Bug Toolkit:

http://tools.cisco.com/Support/BugToolKit/

(If you request a defect that cannot be displayed, the defect number might not exist, the defect might not yet have a customer-visible description, or the defect might be marked Cisco Confidential.)

Troubleshooting

For the most up-to-date, detailed troubleshooting information, refer to the Cisco TAC website at:

http://www.cisco.com/tac

Click **Troubleshooting**. Then choose your product and then select the **Troubleshoot and Alerts** heading on the product page to find information on the problem you are experiencing and other service advisories.

For additional suggestions on troubleshooting mesh networks, refer to the *Troubleshooting Mesh Networks* document at the following Cisco.com URL:

http://www.cisco.com/en/US/products/ps6548/prod_troubleshooting_guides_list.html

Related Documentation

The following documents are related to mesh networks:

- *Cisco Aironet 1500 Series Outdoor Mesh Access Point Hardware Installation Guide*
- *Cisco Aironet Series 1500 Access Point LED Indicator Installation Instructions*
- *Cisco Aironet 8-dBi Omnidirectional Antenna (AIR-ANT5180V-N) and Cisco Aironet 5-dBi Omnidirectional Antenna (AIR-ANT2450V-N)*
- *Cisco Wireless LAN Controller Command Reference, Release 4.2*
- *Cisco Wireless Control System Configuration Guide, Release 6.0* (See also versions for 4.2 and 5.0)
- *Troubleshooting a Mesh Network*

Click this link to browse to the Cisco Support and Documentation page:

http://www.cisco.com/cisco/web/support/index.html

Obtaining Documentation, Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

This document is to be used in conjunction with the documents listed in the Related Documents section.