The access point LED signals are listed in Table 3-1.

Table 3-1 Access Point LED Signals

LED	Color[1, 2]	Meaning
Status	Off	–
	Green	Access point is operational.
	Blinking green	Download or upgrade of Cisco IOS image file in progress.
	Amber	Mesh neighbor access point discovery in progress.
	Blinking amber	Mesh authentication in progress.
	Blinking red / green /amber	LWAPP discovery in progress.
	Red	Firmware failure. Contact your support organization for assistance.
Uplink	Off	No physical connector present or the uplink port is not operational.
	Green	Uplink network is operational (cable, fiber optic, or Ethernet).
RF-1 (2.4-GHz radio)	Off	Radio turned off.
	Green	Radio is operational.
	Red	Firmware failure. Contact your support organization for assistance.
RF-2 (5-GHz radio)	Off	Radio turned off.
	Green	Radio is operational.
	Red	Firmware failure. Contact your support organization for assistance.

1. If all LEDs off, the access point has no power.
2. When the access point power supply is initially turned on, all LEDs are amber.

Verifying Controller Association

To verify that your access point is associated to the controller, follow these steps:

Step 1 Log into your controller web interface using a web browser.

You can also use the controller CLI **show ap summary** command from the controller console port.

Step 2 Click **Wireless,** and verify that your access point MAC address is listed under Ethernet MAC.

Step 3 Log out of the controller, and close your web browser.

Changing the Bridge Group Name

The bridge group name (BGN) controls the association of the access points to a RAP. BGNs can be used to logically group the radios to avoid different networks on the same channel from communicating with each other. This setting is also useful if you have more than one RAP in your network in the same area.

If you have two RAPs in your network in the same area (for more capacity), we recommend that you configure the two RAPs with different BGNs and on different channels.

The BGN is a string of ten characters maximum. A factory-set bridge group name (NULL VALUE) is assigned during manufacturing. It is not visible to you, but allows new access point radios to join a network of new access points. The BGN can be reconfigured from the Controller CLI and GUI. After configuring the BGN, the access point reboots.

After the access points are deployed and associated to the controller, the BGN should be changed from the default value to prevent the MAPs from attempting to associate to other mesh networks.

The BGN should be configured very carefully on a live network. You should always start with the most distant access point (last node) from the RAP and move towards the RAP. If you start configuring the BGN in a different location, then the access points beyond this point (farther away) are dropped, as they have a different BGN.

To configure the BGN for the access points using the controller GUI, follow these steps:

Step 1 Log into your controller using a web browser.

Step 2 Click **Wireless**. When access points associates to the controller, the access point's name appears in the AP Name list.

Step 3 Click on an access point's name.

Step 4 Find the Mesh Information section, and enter the new BGN in the Bridge Group Name field.

Step 5 Click **Apply**.

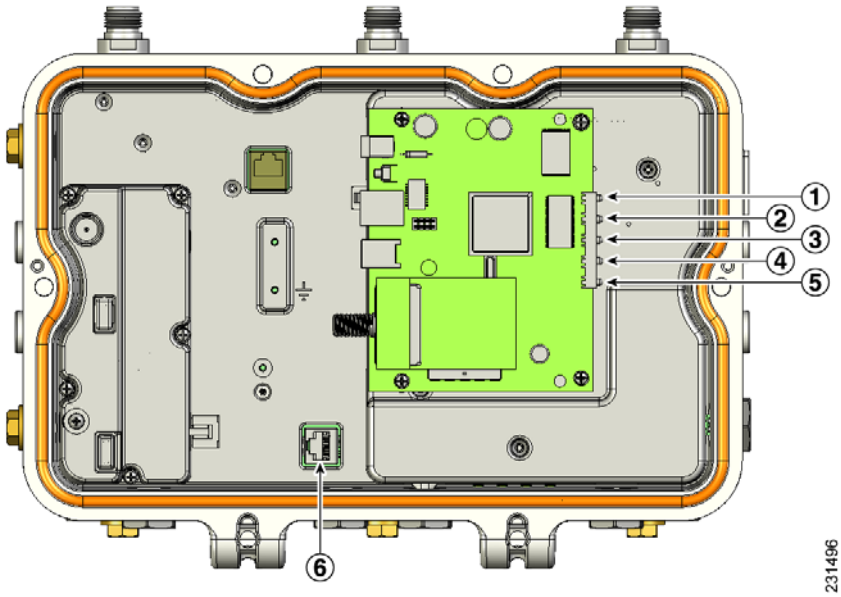
Step 6 Repeat Steps 2 through 5 for each access point.

Step 7 Log out from your controller, and close your web browser.

Cable Modem LEDs

The internal cable modem in the access point cable configuration has five LEDs (see Figure 3-2). To view the cable modem LEDs, you must open the access point hinged cover (refer to the "Opening the Access Point Hinged Cover" section on page 2-38). After viewing the LEDs, you must close the hinged cover (refer to the "Closing the Access Point Hinged Cover" section on page 2-39).

Figure 3-2 Cable Modem LEDs and Console Port Location



1	Power LED	**4**	Cable LED
2	Receive data LED	**5**	PC LED
3	Send data LED	**6**	Console port connector[1]

1. The console port is available on all access point configurations.

Table 3-2 describes the status information provided by the cable modem LEDs.

Table 3-2 Cable LED Status Information

LEDs	Description
Power	Green indicates power is available.
Receive data	Blinking green indicates that the cable modem is receiving data from the cable network.
Send data	Blinking green indicates that the cable modem is sending data to the cable network.
Cable	Green indicates that the cable modem is registered on the cable network and is operational. Blinking green indicates that the cable modem is performing one of these operations: • Booting up. • Scanning the network and attempting to register. • Lost registration on the cable network and attempting to reregister.
PC	Green indicates that an Ethernet carrier has been detected. Blinking green indicates that data is been transferred between the PC and the cable modem.

Connecting to the Access Point Locally

If you need to monitor the access point locally (without connecting the access point to a wired LAN), you can connect a PC to its console port using a DB-9 to RJ-45 serial cable.

Note The console port should only be used for debugging in a lab environment.

Follow these steps to open the CLI by connecting to the access point console port:

Step 1 Open the hinged cover of the access point (see "Opening the Access Point Hinged Cover" section on page 2-38 for instructions).

Connect a nine-pin, female DB-9 to RJ-45 serial cable to the RJ-45 console port on the access point and to the COM port on a computer (see Figure 3-2 for the console port location).

Note The Cisco part number for the DB-9 to RJ-45 serial cable is AIR-CONCAB1200. Browse to http://www.cisco.com/go/marketplace to order a serial cable.

Step 2 Set up a terminal emulator program on your PC to communicate with the access point. Use the following settings for the terminal emulator connection: 9600 baud, 8 data bits, no parity, 1 stop bit, and no flow control.

Step 3 When finished, remove your serial cable, and close the hinged cover (see the "Closing the Access Point Hinged Cover" section on page 2-39 for instructions).

Access Point Power Injector

The power injector (AIR-PWRINJ1500-2=) has three LEDs on the front end of the case (see Figure 3-3).

Figure 3-3 Power Injector Connectors and LEDs

1	Mounting tab	**4**	AC power LED
2	Access point power LED	**5**	Ethernet connector (RJ-45) to access point (10/100/1000BASE-T)
3	Fault LED	**6**	Ethernet connector (RJ-45) to switch (10/100/1000BASE-T)

Monitoring the Power Injector LEDs

You can use the AP Power, Fault, and AC Power LEDs to check the power injector status. The LEDs provide the following status information:

- AP Power LED—Turns solid green after successful discovery; indicates that power injector is supplying power to the access point.
- Fault LED—Turns solid red when a fault occurs during discovery mode or power-up. Check Ethernet cables and connections before contacting your support organization for assistance.
- AC Power LED—Turns solid green when power injector is receiving AC power and is ready to provide power to the access point.

CHAPTER 4

Installing or Replacing the Backup Battery

This chapter describes the procedures to install or replace the backup battery in the access point. These sections are included in this chapter:

Before Beginning the Installation or Replacement

The backup battery is located internal to the access point and attached to the radio cover. The backup battery cannot be installed or replaced in an outdoor environment, you must use a static protected work surface within an indoor environment.

Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.** Statement 1030

Caution ESD can damage the internal components of the access point. It is recommended that the backup battery installation or replacement procedures be performed by an ESD trained service technician at an ESD-protected workstation.

The following operations summarize the backup battery installation or replacement procedure:

1. If the access point has been deployed, deactivate all power sources, remove all cables, remove the access point.
2. Follow standard electrostatic discharge (ESD) procedures.
3. Place the access point on an indoor ESD-protected work surface.
4. Open the access point's radio cover.
5. If applicable, remove the defective backup battery.
6. Install the new backup battery.
7. Connect the backup battery cable.
8. Close the access point’s radio cover.
9. Deploy your access point.

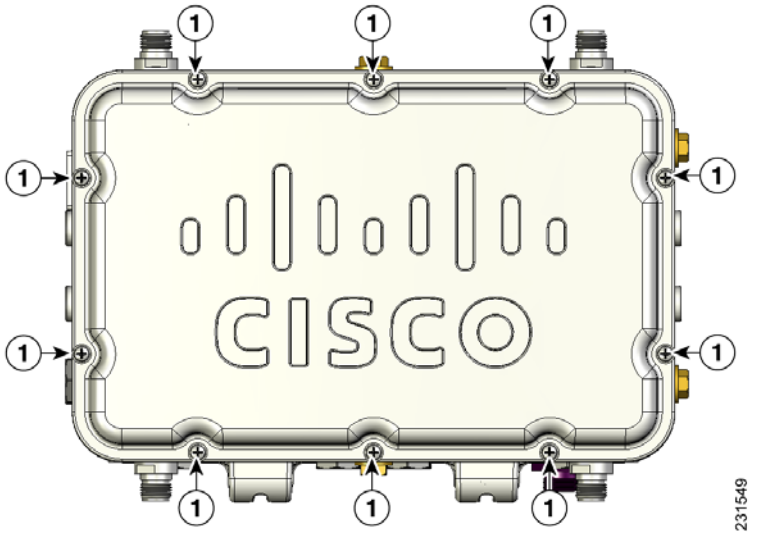
Opening the Access Point Radio Cover

Follow these procedures to open the access point radio cover:

Step 1 Position the access point with the cover attached with hex bolts facing down.

Step 2 Use a #8 Torx screwdriver to unscrew all the Torx screws on the access point cover, but do not attempt to remove the screws (see Figure 4-1).

Figure 4-1 Access Point Radio Cover Screws



1	Radio cover Torx screws

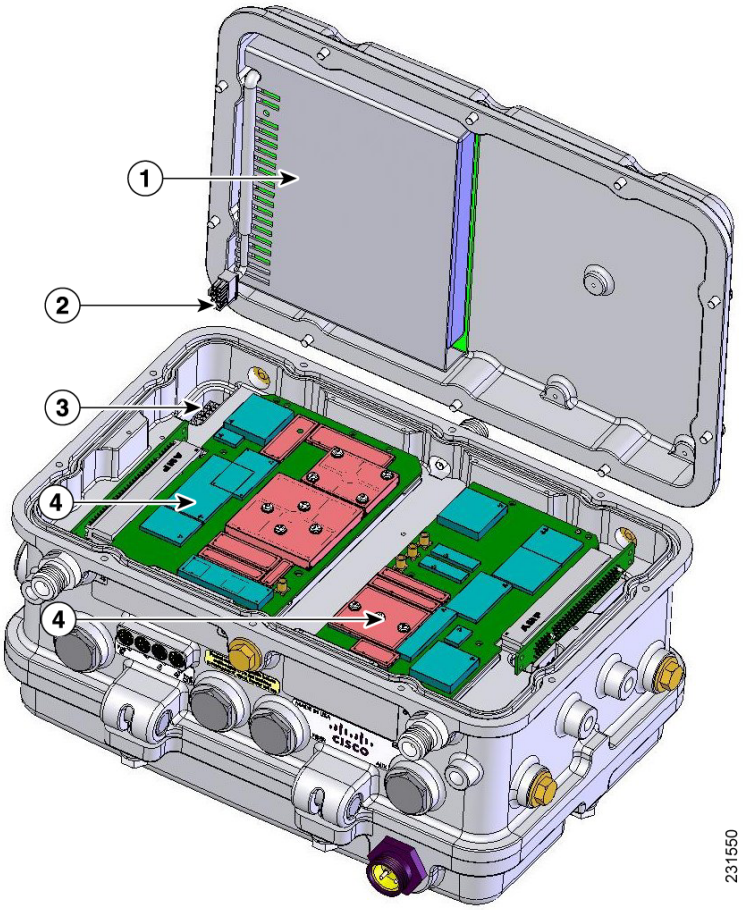
Step 3 Carefully open the cover.

Removing a Backup Battery

Follow these steps to remove a backup battery:

Step 1 While holding the access point cover open, carefully disconnect the backup battery cable from the internal connector (see Figure 4-2). Be careful not to touch the radio board components.

Figure 4-2 Battery Backup Location

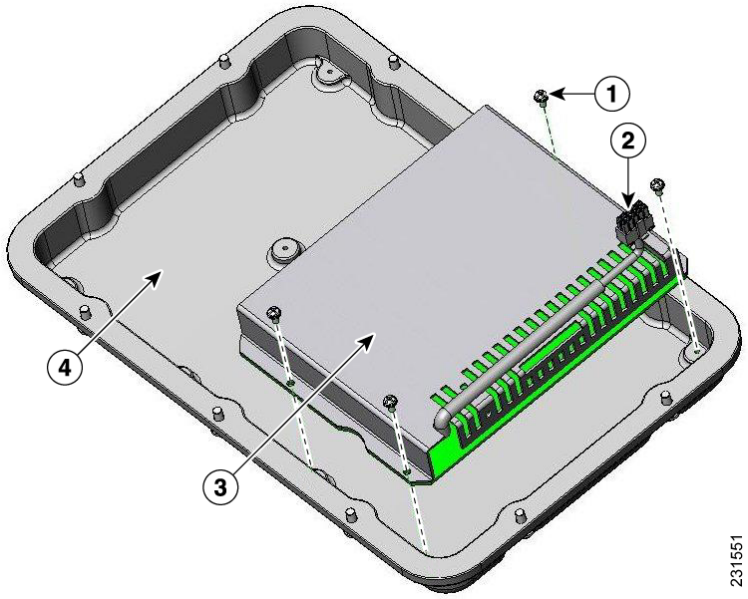


1	Backup battery	**3**	Internal connector for the backup battery cable
2	Backup battery cable	**4**	Radio boards (Do not touch)

Step 2 Carefully place the cover onto your static-protected table.

Step 3 Use a phillips screw driver to remove the four screws attaching the backup battery to the cover (see Figure 4-3).

Figure 4-3 Backup Battery Screws



1	Battery backup screws (4 places)	**3**	Backup battery
2	Battery backup cable and connector	**4**	Access point radio cover

Installing a New Backup Battery

Follow these steps to install a new backup battery into your access point:

Step 1 Carefully orient your new backup battery as shown in Figure 4-3 over the access point radio cover.

Step 2 Position the backup battery over the four screw holes in the radio cover.

Step 3 Use the four supplied screws to attach the backup battery to the radio cover and tighten to 5.5 to 6.5 in. lbs (0.62 to 0.73 Nm).

Step 4 Position and bend the backup battery cable as shown in Figure 4-3.

Connecting the Backup Battery Cable and Closing the Radio Cover

Follow these steps to connect the backup battery cable and close the access point radio cover:

Step 1 Carefully position the access point radio cover over the access point as shown in Figure 4-2.

Step 2 Hold the radio cover upright while placing the edge of the radio cover on the top edge of the access point.

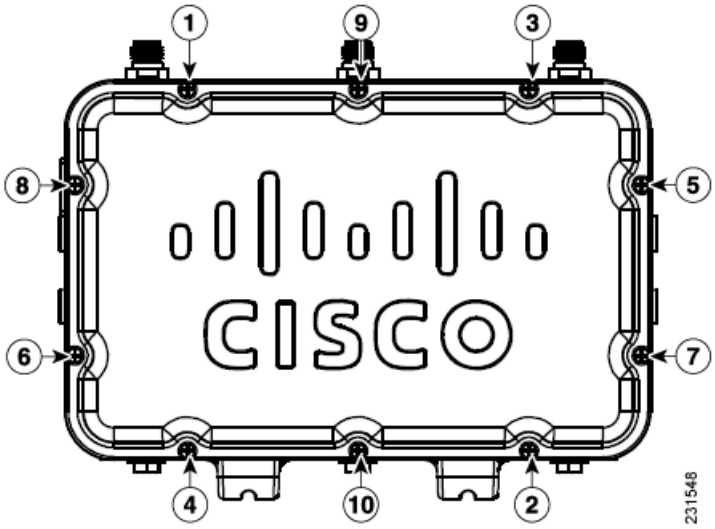
Step 3 Carefully push the backup battery cable connector into the internal battery connector (see Figure 4-2).

Step 4 Close the radio cover, while being careful not to pinch the backup battery cable.

Step 5 Use a Phillips screwdriver to partially tighten each cover screw in the tightening sequence shown in Figure 4-4. Tighten each screw to 11 to 12 in. lbs (1.24 to 1.36 Nm).

Step 6 Repeat Step 5 using the same tightening sequence to fully tighten each screw to 22 to 24 in. lbs (2.49 to 2.71 Nm).

Figure 4-4 Radio Cover Screw Tightening Sequence



What to do Next

After you have completed the backup battery procedures, your access point is ready to be deployed. Carefully read and follow the safety and installation guidelines and instructions contained in the "Mounting Instructions" section on page 2-1 or the mounting instructions document that shipped with your access point.

APPENDIX A

Translated Safety Warnings

For translated safety warnings, refer to the safety warning document that shipped with your access point or that is available on Cisco.com.

To browse to the document on Cisco.com, follow these steps:

Step 1 Click this link to the Cisco Wireless documentation home page:

Step 2 http://www.cisco.com/en/US/products/hw/wireless/index.html

Step 3 Click **Cisco Aironet 1520 Series** listed under Outdoor Wireless.

Step 4 Click **Install and Upgrade**.

Step 5 Click **Install and Upgrade Guides**.

Step 6 Click **Translated Safety Warnings for Cisco Aironet 1520G Series Outdoor Mesh Access Points**.

APPENDIX B

Declarations of Conformity and Regulatory Information

This appendix provides declarations of conformity and regulatory information for the Cisco Aironet 1520 series lightweight outdoor mesh access point.

This appendix contains the following sections:

Manufacturers Federal Communication Commission Declaration of Conformity Statement for Model LAP1522

Model:

AIR-LAP1522AG-A-K9

FCC Certification number:

AIR-RM1520G-A-K9:	LDK102064
AIR-RM1520A-A-K9:	LDK102063

Manufacturer:

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

This device complies with Part 15 rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and radiates radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference. However, there is no guarantee that interference will not occur. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician.

Caution The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency when using Cisco-supplied antennas. Any changes or modification to the product not expressly approved by Cisco could void the user's authority to operate this device.

Caution To meet regulatory restrictions, the access point must be professionally installed.

Note The use of the 4.9-GHz band requires a license and may be used only by qualified Public Safety operators as defined in section 90.20 of the FCC rules.

VCCI Statement for Japan

Warning **This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.**

警告 VCCI 準拠クラスB機器（日本）
この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをしてください。

Department of Communications—Canada

IC Certification Number:

AIR-RM1520G-A-K9:	2461B-102064
AIR-RM1520A-A-K9:	2461B-102063

Canadian Compliance Statement

This Class B Digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe B respecte les exigences du Reglement sur le material broilleur du Canada.

This device complies with Class B Limits of Industry Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Cisco’s access points are certified to the requirements of RSS-210 issue 5, RSP 100, and RSS 102 for spread spectrum devices.

Declaration of Conformity for RF Exposure

This access point product has been found to be compliant to the requirements set forth in CFR 47 Section 1.1307 addressing RF Exposure from radio frequency devices as defined in Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.T he antennas should be positioned more than 6.56 feet (2 meters) from your body or nearby persons.

This access point is also compliant to EN 50835 for RF exposure.

European Community, Switzerland, Norway, Iceland, and Liechtenstein

Lightweight Access Point Models:

AIR-LAP1522G-E-K9
AIR-LAP1522AG-E-K9

Declaration of Conformity with Regard to the 1999/5/EC (R&TTE Directive)

This declaration is only valid for configurations (combinations of software, firmware, and hardware) provided and supported by Cisco Systems. The use of software or firmware not provided and supported by Cisco Systems may result in the equipment no longer being compliant with the regulatory requirements.

Česky [Czech]:	Toto zařízení je v souladu se základními požadavky a ostatními odpovídajícími ustanoveními Směrnice 1999/5/EC.
Dansk [Danish]:	Dette udstyr er i overensstemmelse med de væsentlige krav og andre relevante bestemmelser i Direktiv 1999/5/EF.
Deutsch [German]:	Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.
Eesti [Estonian]:	See seade vastab direktiivi 1999/5/EÜ olulistele nõuetele ja teistele asjakohastele sätetele.
English:	This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]:	Este equipo cumple con los requisitos esenciales asi como con otras disposiciones de la Directiva 1999/5/CE.
Ελληνική [Greek]:	Αυτός ο εξοπλισμός είναι σε συμμόρφωση με τις ουσιώδεις απαιτήσεις και άλλες σχετικές διατάξεις της Οδηγίας 1999/5/EC.
Français [French]:	Cet appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la Directive 1999/5/EC.
Íslenska [Icelandic]:	Þetta tæki er samkvæmt grunnkröfum og öðrum viðeigandi ákvæðum Tilskipunar 1999/5/EC.
Italiano [Italian]:	Questo apparato é conforme ai requisiti essenziali ed agli altri principi sanciti dalla Direttiva 1999/5/CE.
Latviski [Latvian]:	Šī iekārta atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]:	Šis įrenginys tenkina 1999/5/EB Direktyvos esminius reikalavimus ir kitas šios direktyvos nuostatas.

121403

Nederlands [Dutch]:	Dit apparaat voldoet aan de essentiele eisen en andere van toepassing zijnde bepalingen van de Richtlijn 1999/5/EC.
Malti [Maltese]:	Dan l-apparat huwa konformi mal-ħtiġiet essenzjali u l-provedimenti l-oħra rilevanti tad-Direttiva 1999/5/EC.
Margyar [Hungarian]:	Ez a készülék teljesíti az alapvető követelményeket és más 1999/5/EK irányelvben meghatározott vonatkozó rendelkezéseket.
Norsk [Norwegian]:	Dette utstyret er i samsvar med de grunnleggende krav og andre relevante bestemmelser i EU-direktiv 1999/5/EF.
Polski [Polish]:	Urządzenie jest zgodne z ogólnymi wymaganiami oraz szczególnymi warunkami określonymi Dyrektywą UE: 1999/5/EC.
Português [Portuguese]:	Este equipamento está em conformidade com os requisitos essenciais e outras provisões relevantes da Directiva 1999/5/EC.
Slovensko [Slovenian]:	Ta naprava je skladna z bistvenimi zahtevami in ostalimi relevantnimi pogoji Direktive 1999/5/EC.
Slovensky [Slovak]:	Toto zariadenie je v zhode so základnými požiadavkami a inými príslušnými nariadeniami direktív: 1999/5/EC.
Suomi [Finnish]:	Tämä laite täyttää direktiivin 1999/5/EY olennaiset vaatimukset ja on siinä asetettujen muiden laitetta koskevien määräysten mukainen.
Svenska [Swedish]:	Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i Direktiv 1999/5/EC.

121404

This device complies with the EMC requirements (EN 60601-1-2) of the Medical Directive 93/42/EEC.

For 2.4 GHz radios, the following standards were applied:

- Radio: EN 300.328-1, EN 300.328-2
- EMC: EN 301.489-1, EN 301.489-17
- Safety: EN 60950

Note This equipment is intended to be used in all EU and EFTA countries. Outdoor use may be restricted to certain frequencies and/or may require a license for operation. For more details, contact Cisco Corporate Compliance.

For 54 Mbps, 5 GHz access points, the following standards were applied:

- Radio: EN 301.893
- EMC: EN 301.489-1, EN 301.489-17
- Safety: EN 60950

The following CE mark is affixed to the access point with a 2.4 GHz radio and a 54 Mbps, 5 GHz radio:

Declaration of Conformity for RF Exposure

The radio has been found to be compliant to the requirements set forth in CFR 47 Sections 2.1091, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices as defined in Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields. The equipment should be installed more than 20 cm (7.9 in.) from your body or nearby persons.

The access point must be installed to maintain a minimum 20 cm (7.9 in.) co-located separation distance from other FCC approved indoor/outdoor antennas used with the access point. Any antennas or transmitters not approved by the FCC cannot be co-located with the access point. The access point's co-located 2.4 GHz and 5 GHz integrated antennas support a minimum separation distance of 8 cm (3.2 in.) and are compliant with the applicable FCC RF exposure limit when transmitting simultaneously.

Note Dual antennas used for diversity operation are not considered co-located.

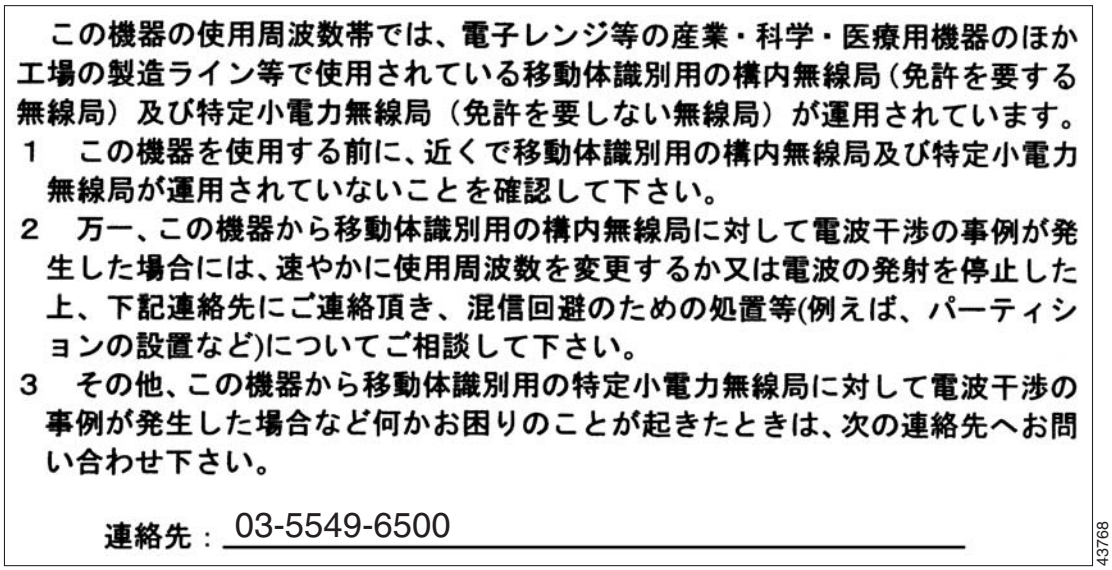
Guidelines for Operating Cisco Aironet Access Points in Japan

This section provides guidelines for avoiding interference when operating Cisco Aironet access points in Japan. These guidelines are provided in both Japanese and English.

Lightweight Access Point Models:

AIR-LAP1522G-P-K9
AIR-LAP1522AG-P-K9

Japanese Translation



English Translation

This equipment operates in the same frequency bandwidth as industrial, scientific, and medical devices such as microwave ovens and mobile object identification (RF-ID) systems (licensed premises radio stations and unlicensed specified low-power radio stations) used in factory production lines.

1. Before using this equipment, make sure that no premises radio stations or specified low-power radio stations of RF-ID are used in the vicinity.
2. If this equipment causes RF interference to a premises radio station of RF-ID, promptly change the frequency or stop using the device; contact the number below and ask for recommendations on avoiding radio interference, such as setting partitions.
3. If this equipment causes RF interference to a specified low-power radio station of RF-ID, contact the number below.

   Contact Number: 03-5549-6500

Administrative Rules for Cisco Aironet Access Points in Taiwan

This section provides administrative rules for operating Cisco Aironet access points in Taiwan. The rules are provided in both Chinese and English.

Chinese Translation

低功率電波輻射性電機管理辦法

第十二條　經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條　低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

127048

English Translation

Administrative Rules for Low-power Radio-Frequency Devices

Article 12

For those low-power radio-frequency devices that have already received a type-approval, companies, business units or users should not change its frequencies, increase its power or change its original features and functions.

Article 14

The operation of the low-power radio-frequency devices is subject to the conditions that no harmful interference is caused to aviation safety and authorized radio station; and if interference is caused, the user must stop operating the device immediately and can't re-operate it until the harmful interference is clear.

The authorized radio station means a radio-communication service operating in accordance with the Communication Act.

The operation of the low-power radio-frequency devices is subject to the interference caused by the operation of an authorized radio station, by another intentional or unintentional radiator, by industrial, scientific and medical (ISM) equipment, or by an incidental radiator.

REVIEW DRAFT—CISCO CONFIDENTIAL

Declaration of Conformity Statements for Model LAP1522

All the Declaration of Conformity statements related to this product can be found at the following URL:

http://www.ciscofax.com

Declaration of Conformity Statements for European Union Countries

DECLARATION OF CONFORMITY
with regard to the R&TTE Directive 1999/5/EC
according to EN 45014

Cisco Systems Inc.
170 West Tasman Drive
San Jose, CA 95134 - USA

Declare under our sole responsibility that the product,

Product:	***AIR-LAP1521G-E-K9*** *Cisco Aironet 2.4 GHz 802.11b/g Outdoor Mesh Access Point* ***AIR-LAP1522AG-E-K9*** *Cisco Aironet Dual band 802/11a/b/g Outdoor Mesh Access Point*
Options included:	***AIR-RM1520G-E-K9*** *Cisco Aironet 2.4 GHz IEEE802.11b/g Radio Module* ***AIR-RM1520A-E-K9*** *Cisco Aironet 5 GHz IEEE802.11a Radio Module* ***AIR-LAP1520*** *(Access Point platform without radio modules)*

Fulfils the essential requirements of the Directive 1999/5/EC

The following standards were applied:

EMC	**EN 301.489-1 v1.4.1: 2002-08; EN 301.489-17 v1.2.1: 2002-09**
Health & Safety	**EN60950-1: 2001; EN 50385: 2002**
Radio	**EN 301.893 v 1.3.1: 2005-08; EN 300 328 v 1.6.1: 2004-11**

The conformity assessment procedure referred to in Article 10.4 and Annex III of Directive 1999/5/EC has been followed.

The product carries the CE Mark: CE 0359

Date & Place of Issue: 15 September 2007, San Jose

Signature:

Tony Youssef
Director Corporate Compliance
Cisco Systems, 125 West Tasman Drive
San Jose, CA 95134 - USA

Additional information:

EMC Test Report:	*Cisco Systems EDCS-594975*
Safety Test Report:	*Cisco Systems EDCS-618531 & EDCS-610294*
Radio Test Report:	*Cisco Systems EDCS-609668 & EDCS-609669*

DofC 620840

Annex to DofC# 620840
Information on Antennas and Power Levels

The AIR-LAP1522AG-E-K9 and the AIR-LAP1521G-E-K9 are equipped with N-type antenna connectors to allow the use of dedicated antennas for both the 2.4 GHz and the 5 GHz radio. (note that the AIR-LAP1521G-E-K9 is a 2.4 GHz only product)

This Declaration of Conformity also covers the antennas listed in table 1 as they were assessed in combination with the product against the essential requirements of the Directive 1999/5/EC.

For each of the antennas, the table lists the maximum conducted output power setting in order to result in a total eirp level below the applicable limit. Any combination of output power and antenna resulting in an eirp level above the regulatory limit is illegal and is outside the scope of this declaration.

This is an outdoor only product, as such the applicable power limit in the 5 GHz band is 1 W eirp.

Antennas not listed in the tables below are also outside the scope of this document.

Table 1: Dedicated antennas

Antenna P/N	Frequency Band[1]	Antenna Gain (dBi)	Maximum Power Setting (dBm)	Antenna Name
AIR-ANT2450V-N	2.4 GHz	5.5	15	Omni Antenna
AIR-ANT2480V-N	2.4 GHz	8	12	Omni Antenna
AIR-ANT5180V-N[2]	5 GHz	8	22	Omni Antenna
AIR-ANT5114P-N[2]	5 GHz	14	16	Patch Antenna
AIR-ANT5117S-N[2]	5 GHz	17	10	Sector Antenna

Note 1: In France, the band 2454 – 2483,5 MHz shall not be used.

Note 2: These antennas are not applicable to the AIR-LAP1521G-E-K9 as this is a 2.4 GHz only product.

September 15, 2007

Tony Youssef
Director Corporate Compliance

Manufacturers Federal Communication Commission Declaration of Conformity Statement for Model LAP1524

This section provides declarations of conformity and regulatory information for the Cisco Aironet 1524 Series Outdoor Mesh Access Point.

Overview

The Cisco Aironet 1524 Series Outdoor Wireless Mesh Access Point (hereafter called the *access point*) is a wireless device designed for wireless client access, point-to-point bridging, point-to-multipoint bridging, and point-to-multipoint mesh wireless connectivity. The access point is a standalone unit that can be mounted on a streetlight pole, building wall, overhang, or a cable strand.access point

The access point (model: LAP1524) supports up to four radios operating in the 2.4-GHz, 4.9-GHz, and 5-GHz frequency bands. The access point provides client access and without the need for a license. The 5-GHz and 4.9-GHz radios are dedicated to backhaul operations to reach a wired network and the 2.4-GHz radio is used for wireless clients. The access point can support 6 to 54 Mbps data rates.

The access point is manufactured in three configurations: cable, pole mount, and mesh. The cable configuration has three antenna connectors on the top of the unit, can be mounted to a cable strand, and supports power-over-cable (POC). The pole mount configuration supports two antennas on the top and bottom of the unit. It can be mounted to a pole or building wall and supports fiber-optic networks and several power options. The Mesh configuration has two antennas on the top and bottom of the unit. It can be powered by AC and only supports wireless backhaul communications to reach the wired network. It does not support hard-wired communications (cable, fiber-optic, or Ethernet) to a wired network.

The access point can also operate as a relay node for other access points not directly connected to a wired network. Intelligent wireless routing is provided by the patented Adaptive Wireless Path Protocol (AWPP). This enables each access point to identify its neighbors and intelligently choose the optimal path to the wired network by calculating the cost of each path in terms of signal strength and the number of hops required to get to a controller.

The access point is configured, monitored, and operated through a Cisco wireless LAN controller (hereafter called a *controller*) as described in the *Cisco Wireless LAN Controller Configuration Guide*. The *Deployment Guide: Cisco Mesh Networking Solution* describes how to plan and initially configure the Cisco mesh network, which supports wireless point-to-point, point-to-multipoint, and mesh deployments. The controllers use a browser-based management system, a command-line interface (CLI), or the Cisco Wireless Control System (WCS) network management system to manage the controller and the associated access points. The access point supports hardware-based advanced encryption standard (AES) encryption between wireless nodes to provide end-to-end security.

Model:

AIR-LAP1524-K9

FCC Certification number:

AIR-RM1520-24-x-K9:	LDK102064
AIR-RM1520-58-x-K9:	LDK102067
AIR-RM1520-49-x-K9	LDK102068

Manufacturer:

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

This device complies with Part 15 rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and radiates radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference. However, there is no guarantee that interference will not occur. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician.

Caution The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency when using Cisco-supplied antennas. Any changes or modification to the product not expressly approved by Cisco could void the user's authority to operate this device.

Caution To meet regulatory restrictions, the access point must be professionally installed.

Note The use of the 4.9-GHz band requires a license and may be used only by qualified Public Safety operators as defined in section 90.20 of the FCC rules.

Industry Canada

IC Certification Number:

AIR-RM1520-24-x-K9:	2461B-102064
AIR-RM1520-58-x-K9:	2461B-102067
AIR-RM1520-49-x-K9	2461B-102068

Canadian Compliance Statement

This Class B Digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe B respecte les exigences du Reglement sur le material broilleur du Canada.

This device complies with Class B Limits of Industry Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Cisco's access points are certified to the requirements of RSS-210 issue 5, RSP 100, and RSS 102 for spread spectrum devices.

Declaration of Conformity for RF Exposure

This access point product has been found to be compliant to the requirements set forth in CFR 47 Section 1.1307 addressing RF Exposure from radio frequency devices as defined in Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.T he antennas should be positioned more than 6.56 feet (2 meters) from your body or nearby persons.

APPENDIX C

Access Point Specifications

Table C-1 lists the technical specifications for the Cisco Aironet 1520 Series Outdoor Mesh Access Point.

Table C-1 Access Point Specifications

Category	Specifications
Size	12.0 in. x 7.8 in. x 6.0 in. (30.5 cm x 19.8 cm x 15.2 cm)
Weight	17.3 lbs. (7.8 kg) with dual radios
Connectors	Two or three Type N antenna connectors for 2.4-GHz radio (depends on configuration) One Type N antenna connector (for 5-GHz radio) Optional AC power connector—3-pin Remke Mini-Link 50908 connector Internal PoE-in connector (Uplink port)—RJ-45 connector Internal PoE-out connector (Downlink port)—RJ-45 connector Optional internal SFP fiber module—Single strand LC fiber connector Optional cable connector—Stinger connector (customer supplied)
Power sources (see Table C-2 and Table C-3 for power distribution budget)	AC power Input volts—100 to 480 VAC 50 to 60 Hz Power injector Input volts—85 to 264 VAC 50 to 60 Hz POC (Quasi-square wave AC) Input volts—40 to 90 Vrms External 12 VDC Input volts—12 VDC
Operating temperature	Access point and power injector –40 to 131°F (–40 to 55°C) **Note** Up to a 20-minute start-up time might be necessary when using a cable modem at temperatures of –20 or less.
Storage temperature	Access point –40 to 185°F (–40 to 85°C) Power injector –58 to 185°F (–50 to 85°C)

Table C-1 Access Point Specifications (continued)

Category	Specifications		
Humidity	Access point 0 to 100% condensing—access point (operating and nonoperating) Power injector 10 to 90% noncondensing—power injector (operating)		
Data rates	1, 2, 5.5, and 11 Mb/s	6, 9, 12, 18, 24, 36, 48, and 54 Mb/s	
Environmental ratings	Complies with NEMA 4 and IP67 requirements		
Maximum elevation	6,561 ft (2,000 m) at 131°F (55°C)—Operating 16,000 ft (4,877 m) at –13°F (–25°C)—Non-operating		
Wind resistance	Up to 100 MPH operational and survivable up to 165 MPH		
RF output power	**802.11b**	**802.11g**	**802.11a**
	28 dBm conducted		28 dBm conducted
	Maximum output depends on the regulatory domain in which the access point is installed. For additional information, refer to the Channels and Power Levels section.		
Frequency	2.400 to 2.484 GHz		4.940 to 4.990 GHz [1] 5.470 to 5.725 GHz 5.725 to 5.85 GHz
	Frequency depends on the regulatory domain in which the access point is installed. For additional information, refer to the Channels and Power Levels section.		
Immunity	Less than or equal to 5 mJ for 6kV/3kA @ 8/20 ms waveform ANSI/IEEE C62.41 EN61000 4-5 Level 4 AC Surge Immunity EN61000 4-4 Level 4 Electrical Fast Transient Burst Immunity EN61000 4-3 Level 4 EMC Field Immunity EN61000 4-2 Level 4 ESD Immunity		
Safety	Designed to meet: IEC 60950-1 UL 60950-1 CSA 60950-1 EN 60950-1		
Radio approvals	FCC Parts 15.247, 90.210 FCC Bulletin OET-65C Canada RSS-210 and RSS-102 AS/NZS 4268.2003		
EMI and susceptibility	FCC Part 15.107 and 15.109 Class B ICES-003 Class B (Canada) EN 55022 B EN 60601-1-2:2001 AS/NZS 3548 Class B VCCI Class B EN 301.489-1 EN 301.489-17		

1. The use of the 4.9-GHz band requires a license and can be used only by qualified public safety operators as defined in section 90.20 of the FCC rules.

Table C-2 lists the power distribution budget for the pole mount or mesh access point configuration.

Table C-2 Power Distribution Budget for Access Point Pole Mount and Mesh Configurations

Element	Power Requirement (Watts)	
Core components	6.9	
802.11a radio	12	
802.11g radio	12	
Fiber-optic SFP	1.1	
Backup battery	10	
PoE-out enabled	17	
Total power budget when using DC power source		59
Total power budget when using AC power source (77% efficiency of AC power supply)		72.6
Total power budget when using PoE power source (92% efficiency of PoE power supply)		63.7

Table C-3 lists the power distribution budged for the cable access point configuration.

Table C-3 Power Distribution Budget for Access Point Cable Configuration

Element	Power Requirement (Watts)	
Core components	7.5	
802.11a radio	12	
802.11g radio	12	
Cable modem with heater	9	
PoE-out enabled	17	
Total power budget when using DC power source		57.5
Total power budget when using POC power source (78% efficiency of AC power supply)		70.2

APPENDIX D

Channels and Power Levels

For channel and maximum power level settings, refer to the *Channels and Maximum Power Settings for Cisco Aironet Lightweight Access Points and Bridges* document available on the Cisco Wireless documentation page of Cisco.com at the following URL:

http://www.cisco.com/en/US/docs/wireless/access_point/channels/lwapp/reference/guide/lw_chp2.html

APPENDIX E

Access Point Pinouts

This appendix describes the pin signals of the access point Ethernet connectors, and the power injector input and output connectors. Table E-1 describes the pin signals of the access point PoE-out connector.

Table E-1 Access Point PoE-Out Ethernet Connector Pinouts

Pin Number	Signal Name
1	Ethernet signal pair (10/100/1000BASE-T)
2	
3	Ethernet signal pair (10/100/1000BASE-T)
6	
4	Ethernet signal pair (10/100/1000BASE-T) and 48 VDC (+)
5	
7	Ethernet signal pair (10/100/1000BASE-T) and 48 VDC return
8	
Shield	Chassis ground

Table E-2 describes the pin signals for the access point PoE-in Ethernet connector.

Table E-2 Access Point PoE-In Ethernet Connector Pinouts

Pin Number	Signal Name
1	Ethernet signal pair (10/100/1000BASE-T) and 56 VDC return
2	
3	Ethernet signal pair (10/100/1000BASE-T) and 56 VDC (+)
6	
4	Ethernet signal pair (1000BASE-T) and 56 VDC (+)
5	
7	Ethernet signal pair (1000BASE-T) and 56 VDC return
8	
Shield	Chassis ground

Table E-3 describes the pin signals for the power injector input connector (To Switch).

Table E-3 Power Injector Input Connector (To Switch) Pinouts

Pin Number	Signal Name
1	Ethernet signal pair (10/100/1000BASE-T)
2	
3	Ethernet signal pair 10/100/1000BASE-T)
6	
4	Ethernet signal pair (1000BASE-T)
5	
7	Ethernet signal pair (1000BASE-T)
8	
Shield	Chassis ground

Table E-4 describes the RJ-45 pin signals for the power injector output connector (To AP).

Table E-4 Power Injector Output Connector (To AP) Pinouts

Pin Number	Signal Name
1	Ethernet signal pair (10/100/1000BASE-T) and 56 VDC return
2	
3	Ethernet signal pair (10/100/1000BASE-T) and 56 VDC (+)
6	
4	Ethernet signal pair (1000BASE-T) and 56 VDC (+)
5	
7	Ethernet signal pair (1000BASE-T) and 56 VDC return
8	
Shield	Chassis ground

Note The power injector output connector (To AP) only supplies 56 VDC power when the Ethernet cable is connected to the 1520 PoE-in connector.

APPENDIX F

Configuring DHCP Option 43

This appendix describes the steps needed to configure DHCP Option 43 on a DHCP server, such as a Cisco Catalyst 3750 series switch, for use with Cisco Aironet lightweight access points. This appendix contains these sections:

Overview

This section contains a DHCP Option 43 configuration example on a DHCP server for use with Cisco Aironet lightweight access points. For other DHCP server implementations, consult DHCP server product documentation for configuring DHCP Option 43. In Option 43, you should use the IP address of the controller management interface.

Note DHCP Option 43 is limited to one access point type per DHCP pool. You must configure a separate DHCP pool for each access point type.

Cisco Aironet 1000 and 1500 series access points use a comma-separated string format for DHCP Option 43. Other Cisco Aironet access points use the type-length-value (TLV) format for DHCP Option 43. DHCP servers must be programmed to return the option based on the access point's DHCP Vendor Class Identifier (VCI) string (DHCP Option 60). The VCI strings for Cisco access points capable of operating in lightweight mode are listed in Table F-1:

Table F-1 Lightweight Access Point VCI Strings

Access Point	Vendor Class Identifier (VCI)
Cisco Aironet 1000 series	Airespace.AP1200
Cisco Aironet 1100 series	Cisco AP c1100
Cisco Aironet 1130 series	Cisco AP c1130
Cisco Aironet 1200 series	Cisco AP c1200
Cisco Aironet 1240 series	Cisco AP c1240
Cisco Aironet 1250 series	Cisco AP c1250
Cisco Aironet 1300 series	Cisco AP c1300
Cisco Aironet 1500 series	Cisco AP c1500[1]
	Cisco AP.OAP1500[2], Cisco AP.LAP1510[2], or Cisco AP.LAP1505[2]
	Airespace.AP1200[3]
Cisco Aironet 1520 series	Cisco AP c1520

1. For controller release 4.1 or later.
2. For controller release 4.0, the VCI depends on the model.
3. For controller release 3.2.

The format of the TLV block for 1100, 1130, 1200, 1240, 1250, 1300, and 1520 series access points is listed below:

- Type: 0xf1 (decimal 241)
- Length: Number of controller IP addresses * 4
- Value: List of WLC management interfaces

Configuring Option 43 for 1000 and 1500 Series Access Points

To configure DHCP Option 43 for Cisco 1000 and 1500 series lightweight access points in the embedded Cisco IOS DHCP server, follow these steps:

Step 1 Enter configuration mode at the Cisco IOS command line interface (CLI).

Step 2 Create the DHCP pool, including the necessary parameters such as default router and name server. The commands used to create a DHCP pool are as follows:

```
ip dhcp pool pool name
network IP Network Netmask
default-router Default router
dns-server DNS Server

Where:
pool name is the name of the DHCP pool, such as AP1000
IP Network is the network IP address where the controller resides, such as 10.0.15.1
Netmask is the subnet mask, such as 255.255.255.0
Default router is the IP address of the default router, such as 10.0.0.1
DNS Server is the IP address of the DNS server, such as 10.0.10.2
```

Step 3 Add the option 60 line for access point using the following syntax:

```
option 60 ascii "VCI string"
```

For the VCI string, use the value from Table F-1. The quotation marks must be included.

Step 4 Add the option 43 line using the following syntax:

```
option 43 ascii "Comma Separated IP Address List"
```

For example, if you are configuring option 43 for Cisco 1000 or 1500 series access points using the controller IP addresses 10.126.126.2 and 10.127.127.2, add the following line to the DHCP pool in the Cisco IOS CLI:

```
option 43 ascii "10.126.126.2,10.127.127.2"
```

The quotation marks must be included.

Configuring Option 43 for 1100, 1130, 1200, 1240, 1250, 1300, and 1520 Series Access Points

To configure DHCP Option 43 for Cisco Aironet 1100, 1130, 1200, 1240, 1250, 1300, and 1520 series lightweight access points in the embedded Cisco IOS DHCP server, follow these steps:

Step 1 Enter configuration mode at the Cisco IOS CLI.

Step 2 Create the DHCP pool, including the necessary parameters such as default router and name server. The commands used to create a DHCP pool are as follows:

```
ip dhcp pool pool name
network IP Network Netmask
default-router Default router
dns-server DNS Server

Where:
pool name is the name of the DHCP pool, such as AP1520
IP Network is the network IP address where the controller resides, such as 10.0.15.1
Netmask is the subnet mask, such as 255.255.255.0
Default router is the IP address of the default router, such as 10.0.0.1
DNS Server is the IP address of the DNS server, such as 10.0.10.2
```

Step 3 Add the option 60 line using the following syntax:

```
option 60 ascii "VCI string"
```

For the VCI string, use the value from Table F-1. The quotation marks must be included.

Step 4 Add the option 43 line using the following syntax:

```
option 43 hex hex string
```

The hex string is assembled by concatenating the TLV values shown below:

Type + *Length* + *Value*

Type is always *f1(hex)*. *Length* is the number of controller management IP addresses times 4 in hex. *Value* is the IP address of the controller listed sequentially in hex.

For example, suppose that there are two controllers with management interface IP addresses, 10.126.126.2 and 10.127.127.2. The type is *f1(hex)*. The length is *2 * 4 = 8 = 08 (hex)*. The IP addresses translate to *0a7e7e02* and *0a7f7f02*. Assembling the string then yields *f1080a7e7e020a7f7f02*. The resulting Cisco IOS command added to the DHCP scope is listed below:

```
option 43 hex f1080a7e7e020a7f7f02
```

GLOSSARY

802.3af The IEEE standard that describes a mechanism for Power over Ethernet (PoE). The standard provides the capability to deliver both power and data over standard Ethernet cabling.

802.11 The IEEE standard that specifies carrier sense media access control and physical layer specifications for 1- and 2-megabit-per-second (Mbps) wireless LANs operating in the 2.4-GHz band.

802.11a The IEEE standard that specifies carrier sense media access control and physical layer specifications for wireless LANs operating in the 5-GHz frequency band.

802.11b The IEEE standard that specifies carrier sense media access control and physical layer specifications for 5.5- and 11-Mbps wireless LANs operating in the 2.4-GHz frequency band.

802.11g The IEEE standard that specifies carrier sense media access control and physical layer specifications for 6, 9, 12, 18, 24, 36, 48, and 54 Mbps wireless LANs operating in the 2.4-GHz frequency band.

A

access point A wireless LAN data transceiver that uses radio waves to connect a wired network with wireless stations.

ad hoc network A wireless network composed of stations without Access Points.

antenna gain The gain of an antenna is a measure of the antenna's ability to direct or focus radio energy over a region of space. High gain antennas have a more focused radiation pattern in a specific direction.

associated A station is configured properly to allow it to wirelessly communicate with an Access Point.

B

beacon A wireless LAN packet that signals the availability and presence of the wireless device. Beacon packets are sent by access points and base stations; however, client radio cards send beacons when operating in computer to computer (Ad Hoc) mode.

BOOTP Boot Protocol. A protocol used for the static assignment of IP addresses to devices on the network.

BPSK Binary phase shift keying is a modulation technique used by IEEE 802.11b-compliant wireless LANs for transmission at 1 Mbps.

broadcast packet A single data message (packet) sent to all addresses on the same subnet.

C

CCK Complementary Code Keying. A modulation technique used by IEEE 802.11b-compliant wireless LANs for transmission at 5.5 and 11 Mbps.

CCKM Cisco Centralized Key Management. Using CCKM, authenticated client devices can roam from one access point to another without any perceptible delay during reassociation. An access point on your network provides wireless domain services (WDS) and creates a cache of security credentials for CCKM-enabled client devices on the subnet. The WDS access point's cache of credentials dramatically reduces the time required for reassociation when a CCKM-enabled client device roams to a new access point.

cell The area of radio range or coverage in which thewireless devices can communicate with the base station. The size of the cell depends upon the speed of the transmission, the type of antenna used, and the physical environment, as well as other factors.

client A radio device that uses the services of an Access Point to communicate wirelessly with other devices on a local area network.

CSMA Carrier sense multiple access. A wireless LAN media access method specified by the IEEE 802.11 specification.

D

data rates The range of data transmission rates supported by a device. Data rates are measured in megabits per second (Mbps).

dBi A ratio of decibels to an isotropic antenna that is commonly used to measure antenna gain. The greater the dBi value, the higher the gain, and the more acute the angle of coverage.

DFS Dynamic Frequency Selection. In some regulatory domains, 5-GHz radios are required to use DFS to avoid interfering with radar signals.

DHCP Dynamic host configuration protocol. A protocol available with many operating systems that automatically issues IP addresses within a specified range to devices on the network. The device retains the assigned address for a specific administrator-defined period.

dipole A type of low-gain (2.2-dBi) antenna consisting of two (often internal) elements.

domain name The text name that refers to a grouping of networks or network resources based on organization-type or geography; for example: name.com—commercial; name.edu—educational; name.gov—government; ISPname.net—network provider (such as an ISP); name.ar—Argentina; name.au—Australia; and so on.

DNS Domain Name System server. A server that translates text names into IP addresses. The server maintains a database of host alphanumeric names and their corresponding IP addresses.

DSSS Direct sequence spread spectrum. A type of spread spectrum radio transmission that spreads its signal continuously over a wide frequency band.

E

EAP Extensible Authentication Protocol. An optional IEEE 802.1x security feature ideal for organizations with a large user base and access to an EAP-enabled Remote Authentication Dial-In User Service (RADIUS) server.

Ethernet The most widely used wired local area network. Ethernet uses carrier sense multiple access (CSMA) to allow computers to share a network and operates at 10, 100, or 1000 Mbps, depending on the physical layer used.

F

file server A repository for files so that a local area network can share files, mail, and programs.

firmware Software that is programmed on a memory chip.

G

gateway A device that connects two otherwise incompatible networks together.

GHz Gigahertz. One billion cycles per second. A unit of measure for frequency.

I

IEEE Institute of Electrical and Electronic Engineers. A professional society serving electrical engineers through its publications, conferences, and standards development activities. The body responsible for the Ethernet 802.3 and wireless LAN 802.11 specifications.

infrastructure The wired Ethernet network.

IP Address The Internet Protocol (IP) address of a station.

IP subnet mask The number used to identify the IP subnetwork, indicating whether the IP address can be recognized on the LAN or if it must be reached through a gateway. This number is expressed in a form similar to an IP address; for example: 255.255.255.0.

isotropic An antenna that radiates its signal in a spherical pattern.

M

MAC Media Access Control address. A unique 48-bit number used in Ethernet data packets to identify an Ethernet device, such as an access point or your client adapter.

MBSSID Multiple basic SSID. Each multiple basic SSID is assigned a unique MAC address. You use multiple BSSIDs to assign a unique DTIM setting for each SSID and to broadcast SSIDs in beacons (one SSID per beacon).

modulation Any of several techniques for combining user information with a transmitter's carrier signal.

multipath The echoes created as a radio signal bounces off of physical objects.

multicast packet A single data message (packet) sent to multiple addresses.

O

omni-directional This typically refers to a primarily circular antenna radiation pattern.

OFDM Orthogonal frequency division multiplex is a modulation technique used by IEEE 802.11a-compliant wireless LANs for transmission at 6, 9, 12, 18, 24, 36, 48, and 54 Mbps.

P

packet A basic message unit for communication across a network. A packet usually includes routing information, data, and sometimes error detection information.

Q

QPSK

Quadruple phase shift keying is a modulation technique used by IEEE 802.11b-compliant wireless LANs for transmission at 2 Mbps.

R

range A linear measure of the distance that a transmitter can send a signal.

receiver sensitivity A measurement of the weakest signal a receiver can receive and still correctly translate it into data.

RF Radio frequency. A generic term for radio-based technology.

roaming A feature of some Access Points that allows users to move through a facility while maintaining an unbroken connection to the LAN.

RP-TNC A connector type unique to Cisco Aironet radios and antennas. Part 15.203 of the FCC rules covering spread spectrum devices limits the types of antennas that may be used with transmission equipment. In compliance with this rule, Cisco Aironet, like all other wireless LAN providers, equips its radios and antennas with a unique connector to prevent attachment of non-approved antennas to radios.

S

spread spectrum A radio transmission technology that spreads the user information over a much wider bandwidth than otherwise required in order to gain benefits such as improved interference tolerance and unlicensed operation.

SSID Service set identifier (also referred to as Radio Network Name). A unique identifier used to identify a radio network and which stations must use to be able to communicate with each other or to an access point. The SSID can be any alphanumeric entry up to a maximum of 32 characters.

T

transmit power The power level of radio transmission.

U

UNII Unlicensed National Information Infrastructure—regulations for UNII devices operating in the 5.15 to 5.35 GHz and 5.725 to 5.825 GHz frequency bands.

UNII-1 Regulations for UNII devices operating in the 5.15 to 5.25 GHz frequency band.

UNII-2 Regulations for UNII devices operating in the 5.25 to 5.35 GHz frequency band.

UNII-3 Regulations for UNII devices operating in the 5.725 to 5.825 GHz frequency band.

unicast packet A single data message (packet) sent to a specific IP address.

W

WDS Wireless Domain Services. An access point providing WDS on your wireless LAN maintains a cache of credentials for CCKM-capable client devices on your wireless LAN. When a CCKM-capable client roams from one access point to another, the WDS access point forwards the client's credentials to the new access point with the multicast key. Only two packets pass between the client and the new access point, greatly shortening the reassociation time.

WEP Wired Equivalent Privacy. An optional security mechanism defined within the 802.11 standard designed to make the link integrity of wireless devices equal to that of a cable.

WLSE Wireless LAN Solutions Engine. The WLSE is a specialized appliance for managing Cisco Aironet wireless LAN infrastructures. It centrally identifies and configures access points in customer-defined groups and reports on throughput and client associations. WLSE's centralized management capabilities are further enhanced with an integrated template-based configuration tool for added configuration ease and improved productivity.

WNM Wireless Network Manager.

workstation A computing device with an installed client adapter.

WPA Wi-Fi Protected Access is a standards-based, interoperable security enhancement that strongly increases the level of data protection and access control for existing and future wireless LAN systems. It is derived from and will be forward-compatible with the upcoming IEEE 802.11i standard. WPA leverages TKIP (Temporal Key Integrity Protocol) for data protection and 802.1X for authenticated key management.

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