



Product Bulletin No. 3058

## Cisco Aironet Access Point Support for Lightweight Access Point Protocol

This product bulletin provides information about operating selected Cisco Aironet access points in Lightweight Access Point Protocol (LWAPP) mode.

Customers can now deploy selected Cisco® Aironet® access points as autonomous access points or as lightweight access points.

The following Cisco Aironet access points have the ability to operate as autonomous access points or lightweight access points:

- Cisco Aironet 1240 AG Series Access Points
- Cisco Aironet 1230 AG Series Access Points
- Cisco Aironet 1200 Series Access Points that contain 802.11g (AIR-MP21G-x-K9) and/or second-generation 802.11a radios (AIR-RM21A-x-K9 or AIR-RM22A-x-K9)
- Cisco Aironet 1130 AG Series Access Points
- Cisco Aironet 1100 Series Access Points that contain 802.11g radios (AIR-AP1121G-x-K9)
- Cisco Aironet 1300 Series Access Points/Bridges (AIR-BR1310G-x-K9 or AIR-BR1310G-x-K9-R). A Cisco Aironet 1300 Series operating in LWAPP mode only operates as an access point. This series does not support LWAPP bridging mode.

The LWAPP-capable access points listed above can be ordered configured for lightweight operation, or can be upgraded from autonomous access point mode to lightweight mode using the Autonomous to Lightweight Mode upgrade tool. Orderable access points configured for lightweight operation contain an “LAP” prefix in the part number, such as AIR-LAP1310G-x-K9. Orderable access points configured for autonomous operation contain the standard “AP” prefix, such as AIR-AP1242AG-x-K9, or “BR” in the case of AIR-BR1310G-x-K9.

All lightweight access points must be used with a Cisco wireless LAN controller. It is not possible for an access point that has been upgraded to LWAPP to operate independently.

The Cisco Aironet lightweight access points listed above are supported on the following controllers that have the requisite memory to hold the additional Cisco Aironet access point image bundles:

- Cisco 2000 Series Wireless LAN Controllers
- Cisco 4400 Series Wireless LAN Controllers

**Note:** The Cisco 2000 Series Wireless LAN Controller is not equivalent to the Airespace 3504, which has insufficient memory to support the lightweight Cisco Aironet access point.

Cisco Aironet LWAPP-capable access points are not supported by the Airespace 3500, 4000, or 4100 Series, or the Cisco 4100 Series Wireless LAN Controllers.

Cisco 1000 Series Access Points will continue to be supported as lightweight access points communicating via LWAPP with Cisco 2000, 4100, or 4400 Series Wireless LAN Controllers or Airespace 3500, 4000, or 4100 Series Wireless LAN Controllers. These access points are supported by all Cisco wireless LAN controllers but cannot operate in autonomous mode.

All Cisco Aironet access points running LWAPP can be managed by the Cisco Wireless Control System (WCS) and can interoperate with the Cisco Wireless Location Appliance.

An autonomous access point upgraded to operate as a lightweight access point can be converted back to an autonomous access point. Please see the following Q&A section for more information.

## RUNNING LWAPP

Cisco Aironet access points running in lightweight mode operate with two Cisco IOS® Software images in flash:

**1. LWAPP Upgrade and Recovery Support Image**—Cisco IOS Software Release 12.3(7)JX. This access point image is available via two methods:

- Loaded on an “LAP” access point ordered with LWAPP preinstalled
- Installed in supported access points by the Autonomous to Lightweight Mode upgrade tool as part of the upgrade process

Special notes about the LWAPP Upgrade and Recovery Support image:

- This image contains the minimum software features necessary to allow an access point to communicate with a Cisco wireless LAN controller and enables the access point to receive the full lightweight image from the controller.
- The LWAPP Upgrade and Recovery Support image is also used as a recovery image in case the full LWAPP image becomes corrupted.
- Access points using the LWAPP Upgrade and Recovery Support image have limited capabilities and their radios are disabled until the Cisco wireless LAN controller sends them the full LWAPP image.

**2. Full Lightweight Image**—This access point image is released as a component of the wireless LAN controller image with LWAPP and Cisco 1000 Series Access Points.

- The wireless LAN controller image is an “image bundle” that includes the LWAPP images for the lightweight access points.
- When an access point initially contacts a controller, it identifies the version of the full LWAPP image it is running, and if it does not match the image in the controller’s image bundle, the controller downloads a new full LWAPP image to the access point.

Because the LWAPP Upgrade and Recovery Support image contains the minimum software features necessary to allow an access point to contact a controller and download a full lightweight image from the controller’s image bundle, it should not be necessary to post frequent LWAPP Upgrade and Recovery Support image updates to Cisco.com; new access point features will be made available via the full LWAPP image contained in the wireless LAN controller image bundle.

## LWAPP Q&A

The following section answers frequently asked questions about Cisco Aironet access point support for LWAPP.

### Products Supported

**Q.** Why would a customer order an LAP version of an access point instead of a Cisco Aironet 1000 Series lightweight access point?

**A.** There are a number of reasons why a customer may prefer to order an LAP version access point.

- Customers may have already deployed “AP” versions of these access points and may wish to maintain, from a hardware perspective, a homogenous environment of access points with common form factors, RF performance, and other hardware-based capabilities as they transition their WLAN from autonomous access points to a lightweight access point solution.
- Customers may prefer the industrial design of these access points relative to the Cisco Aironet 1000 Series.
- LAP access points include versatile mounting systems that support deployment on walls, on ceilings, and above suspended ceilings. These mounting systems provide physical security for the access point via a variety of locking mechanisms, and support versatile cable management.

- Cisco Aironet 1200 Series, Aironet 1230 AG Series, and Aironet 1240 AG Series Access Points allow for operation at temperatures as low as  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ) while the connectorized version of the Cisco Aironet 1000 Series Access Point (AP1020) provides a  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) minimum operating temperature. This difference can be critical in certain operating environments.
- LWAPP-capable access points have a read-only console port for additional diagnostic information.

**Q.** What access point platforms have the ability to operate as autonomous access points or lightweight access points?

**A.** The following Cisco Aironet access points can operate as autonomous access points or lightweight access points:

- Cisco Aironet 1240AG Series Access Points
- Cisco Aironet 1230AG Series Access Points
- Cisco Aironet 1200 Series Access Points that contain 802.11g (AIR-MP21G-x-K9) and/or second-generation 802.11a radios (AIR-RM21A-x-K9 or AIR-RM22A-x-K9)
- Cisco Aironet 1130 AG Series Access Points
- Cisco Aironet 1100 Series Access Points that contain 802.11g radios (AIR-AP1121G-x-K9)
- Cisco Aironet 1300 Series Access Points (AIR-BR1310G-x-K9 or AIR-BR1310G-x-K9-R). A Cisco Aironet 1300 Series operating in LWAPP mode only operates as an access point. This series does not support LWAPP bridging mode.

**Note:** The Cisco Aironet 1000 Series Access Points continue to be supported as lightweight access points.

**Q.** What access point radios will be supported in access points operating as lightweight access points?

**A.** The following radios are supported by access points operating as lightweight access points:

- 802.11g radio (AIR-MP21G-x-K9)
- Second-generation 802.11a radio (AIR-RM21A-x-K9 or AIR-RM22A-x-K9)
- Support for the 802.11b radio is not provided because it does not support Advanced Encryption Standard (AES) encryption or Multiple Broadcast System Set Identifier (MBSSID), both of which are integral to lightweight operation.

**Q.** Which Cisco wireless LAN controllers support access points operating as lightweight access points?

**A.** The following Cisco wireless LAN controllers support access points operating as lightweight access points:

- Cisco Aironet 2000 Series Wireless LAN Controllers
- Cisco Aironet 4400 Series Wireless LAN Controllers
- All future Cisco modules and controllers that support LWAPP

**Q.** Are there any additional software licensing costs associated with running LWAPP on Cisco Aironet access points?

**A.** No. There are no additional software licensing costs involved associated within running LWAPP on Cisco Aironet autonomous access points upgraded to lightweight mode. LWAPP is provided via a free Cisco IOS Software upgrade for users with a Cisco.com login account.

## Deployment

**Q.** Are the Autonomous to Lightweight Mode upgrade tool and the associated Cisco IOS Software Release 12.3(7)JX deployment process similar to the process that was used for converting Cisco Aironet access points from VxWorks to Cisco IOS Software?

**A.** No. Upgrading an access point from autonomous mode to lightweight mode using the Autonomous to Lightweight Mode upgrade tool and associated Cisco IOS Software Release 12.3(7)JX is not the same as the migration process from VxWorks to Cisco IOS Software. The autonomous mode to lightweight mode process is a software upgrade to the existing Cisco IOS Software image. It is not an operating system swap out. In lightweight mode, Cisco IOS Software continues to run on the access point, and LWAPP is used to talk to a wireless LAN controller. One benefit of LWAPP is the automatic access point configuration, which obviates the need to retain or convert the original autonomous Cisco IOS access point configuration.

**Q.** Will a lightweight access point be able to talk to a Cisco Wireless Domain Services (WDS) device such as the Cisco Catalyst® 6500 Series Wireless LAN Services Module (WLSM)?

**A.** The access point's lightweight image will only be able to talk to an LWAPP-enabled wireless LAN controller. Lightweight access points cannot talk to a Cisco WDS device. LWAPP coupled with a controller obviates the need for Cisco WDS or a WDS device.

**Q.** Can an access point that was converted from autonomous mode to lightweight mode supporting LWAPP be converted back to autonomous mode running Cisco IOS Software?

**A.** Yes. In order to convert an access point operating in lightweight mode back to autonomous mode, a new image must be placed on the access point. This can be performed via the following:

- If the access point is in contact with a controller, the controller can initiate the download of an autonomous Cisco IOS Software image.
- If the access point cannot contact a controller, it can be reverted back to autonomous Cisco IOS Software by rebooting the access point with the reset button pressed. Upon bootup, the access point looks for a Trivial File Transfer Protocol (TFTP) server on the local subnet with an image named for it.

**Note:** It is possible to disable the access point reset button via a configuration option on the controller or Cisco WCS. Doing so would prevent this method of reverting back to autonomous Cisco IOS Software mode.

**Q.** What external antennas are supported for RF management and location fingerprinting under LWAPP?

**A.** In addition to the integrated antennas, the following external antennas are supported on LWAPP-enabled versions of connectorized Cisco Aironet 1200 Series and Aironet 1240 Series Access Points only:

- 802.11a:
  - AIR-ANT5135D-R (3.5 dBi dipole)
  - AIR-ANT-5145V-R (4.5 dBi omni)
  - AIR-ANT5160V-R (6 dBi omni)
- 802.11g:
  - AIR-ANT1728 (5.2 dBi ceiling omni)
  - AIR-ANT1729 (6 dBi patch)
  - AIR-ANT2012 (6.5 dBi diversity patch)
  - AIR-ANT2410Y-R (10 dBi Yagi)
  - AIR-ANT5959 (2 dBi diversity omni)
  - AIR-ANT3549 (9 dBi patch)
  - AIR-ANT4941 (2.2 dBi dipole)
  - AIR-ANT2506 (5.2 dBi omni)
  - AIR-ANT3213 (5.2 dBi pillar omni)

The following external antennas are supported on LWAPP-enabled versions of the connectorized Cisco Aironet 1300 Series Access Points:

- AIR-ANT2506 (5.2 dBi omni)
- AIR-ANT3549 (9 dBi patch)
- AIR-ANT2410Y-R (10 dBi Yagi)

**Q.** What features are implemented differently on Cisco Aironet 1000 Series Access Points compared to the lightweight versions of the Cisco Aironet 1100, Aironet 1130 AG, Aironet 1200, Aironet 1230 AG, Aironet 1240 AG, and Aironet 1300 Series Access Points?

**A.** The following features are implemented differently on Cisco Aironet 1000 Series Access Points compared to the lightweight versions of the Cisco Aironet 1100, Aironet 1130 AG, Aironet 1200, Aironet 1230 AG, Aironet 1240 AG, and Aironet 1300 Series Access Points:

- Reset button: LAP devices have a reset button. The reset button can be configured to be disabled from the controller or the Cisco WCS.
- LED usage: Cisco Aironet access points will have different LED conventions.
- Fallback image: Cisco Aironet access points will not be able to store the previous version of their software image in addition to the currently executing image, and will instead have a fallback LWAPP Upgrade and Recovery support image.
- Revert back to Cisco IOS Software: Cisco Aironet access points can be restored to standalone Cisco IOS Software access points.
- Rogue containment: To maintain regulatory compliance, LAP devices will not provide rogue containment or neighbor discovery on channels that are not in the operating regulatory domain.
- Console port usage: The console port on LAP access points is enabled in read-only mode.

**Q.** What features present in Cisco Aironet 1000 Series Access Points will not be available in the LAP versions of Cisco Aironet 1100, Aironet 1130 AG, Aironet 1200, Aironet 1230 AG, Aironet 1240 AG, and Aironet 1300 Series Access Points?

**A.** While the vast majority of LWAPP features are supported by these access points, there are some features available on Cisco Aironet 1000 Series Access Points that are not available on LAP access points. None of these features are considered to be significant obstacles to a full WLAN deployment; they are listed here so that customers can be fully aware of any device limitations.

- Support for 8 instead of 16 basic service set identifiers (BSSIDs)
  - Background: LAP devices will support a maximum of 8 BSSIDs per access point. Cisco Aironet 1000 Series Access Points support up to 16 BSSIDs per access point.
  - The need for more than 16 BSSIDs is minimized because of the LWAPP architecture's "Identity-Based Networking" feature, whereby the authentication, authorization, and accounting (AAA) server can map, on a per-user basis, between any wireless BSSID to any of 256 wired-side VLANs.
- Cisco Aironet access points running LWAPP are not supported on the Aireospace 3500, 4000, and 4100 Series, and Cisco 4100 Series Wireless LAN Controllers.
  - These controllers do not have sufficient memory to store the wireless LAN controller image bundle that contains the LWAPP images for the Cisco Aironet access points.
- Layer 2 LWAPP is not supported.
  - All access points have to get an IP address and discover the controller via Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS), IP subnet broadcast, or Over the Air Programming (OTAP).
  - This feature is not implemented because most Cisco customers are comfortable with a reliance on IP for data networking and Cisco access points use IP addresses today.
- Wired Equivalent Privacy (WEP) 152 is not supported. WEP is available in three formats:
  - 64-bit WEP = 40-bit secret key and 24-bit initialization vector
  - 128-bit WEP = 104-bit secret key and 24-bit initialization vector
  - 152-bit WEP = 128-bit secret key and 24-bit initialization vector

152-bit WEP is not implemented on Cisco LAP access points because the extra key length does not add any appreciable security and most client devices do not support 152-bit WEP. Wi-Fi Protected Access (WPA)-Temporal Key Integrity Protocol (TKIP) or WPA2-AES are the best ways to address WEP security issues.

- Bridge mode is not available on a Cisco Aironet 1300 Series Access Point running the LWAPP.

A Cisco Aironet 1300 Series Access Point that has been converted to LWAPP functions similarly to a traditional access point, and does not support wireless mesh or bridging functionality. The Cisco Aironet 1500 Series and Aironet 1030 Access Points support LWAPP bridging mode.

## RELATED INFORMATION

For more product and ordering information about Cisco Aironet products, visit: <http://www.cisco.com/go/aironet>

For more information on upgrading existing access points to LWAPP, visit:  
[http://www.cisco.com/en/US/products/hw/wireless/ps430/prod\\_bulletins\\_list.html](http://www.cisco.com/en/US/products/hw/wireless/ps430/prod_bulletins_list.html)

For more information on the current wireless LAN controller image, visit:  
[http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps6306/prod\\_bulletin0900aecd803136f5.html](http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps6306/prod_bulletin0900aecd803136f5.html)



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