CISCO SYSTEMS

Data Sheet

# Cisco Aironet 1500 Series Lightweight Outdoor Mesh Access Points

Figure 1. Cisco Aironet 1500 Series

PRODUCT OVERVIEW

Cisco® Aironet® 1500 Series lightweight outdoor mesh access points enable cost-effective, scalable deployment of secure outdoor wireless LANs. With dual-band, simultaneous support for IEEE 802.11a and 802.11b/g standards, the Cisco Aironet 1500 Series employs a patent-pending Adaptive Wireless Path Protocol to form a dynamic wireless mesh network between remote access points, and delivers secure wireless access to any Wi-Fi-compliant client (Figure 2).

Figure 2. Cisco Wireless Mesh Networking Solution
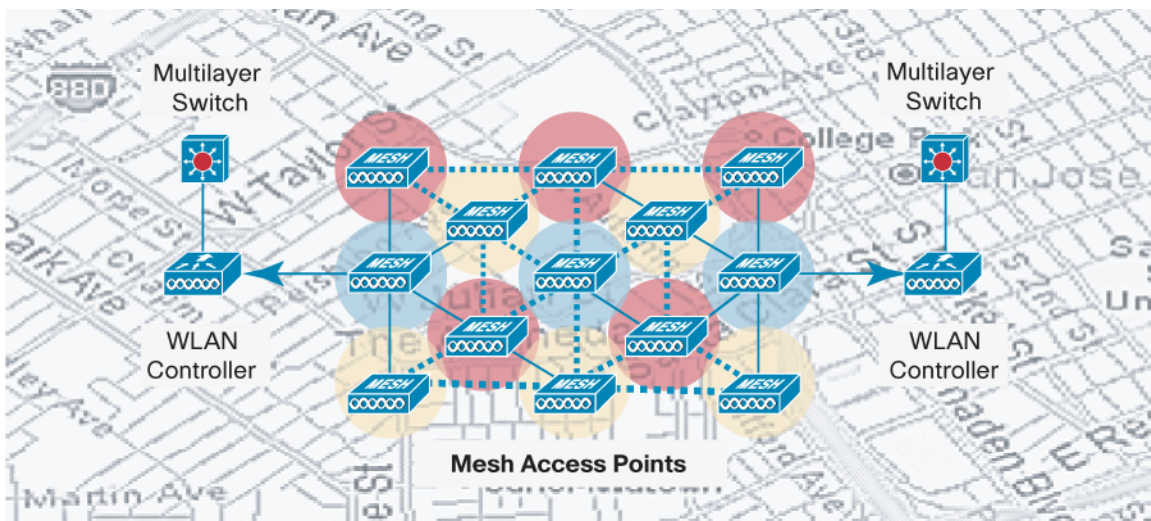
The Cisco Aironet 1500 Series operates with Cisco wireless LAN controllers and Cisco Wireless Control System (WCS) Software, centralizing key functions of wireless LANs to provide scalable management, security, and mobility that is seamless between indoor and outdoor deployments. Designed to support zero-configuration deployments, the Cisco Aironet 1500 Series easily and securely joins the mesh network, and is available to manage and monitor the network through the controller and WCS graphical or command-line interfaces (CLIs). Compliant with Wi-Fi Protected Access 2 (WPA2) and employing hardware-based Advanced Encryption Standard (AES) encryption between wireless nodes, the Cisco Aironet 1500 Series provides end-to-end security.

## INTELLIGENT WIRELESS ROUTING

The Cisco Aironet 1500 Series can be installed anywhere power is available, without the need for a network connection. Intelligent wireless routing based on the patent-pending Adaptive Wireless Path Protocol, which was designed specifically for wireless environments, enables a remote access point to dynamically optimize the best route to the connected network within the mesh, providing resiliency to interference and helping ensure high network capacity. Deployment and management costs for the Cisco Aironet 1500 Series are reduced through support of zero-configuration deployments and through the access points' ability to self-heal in response to interference or outages.

The Cisco Aironet 1500 Series dedicates a radio for access-point-to-access-point communications, allowing the mesh network to maximize use of the total available channels and minimize the occurrence of interference, resulting in more capacity than is available with solutions that use only a single radio. When more capacity is needed, additional sectors need only be enabled, such as by provisioning a network connection to a remote access point. The mesh will dynamically re-optimize itself when this is done.

CISCO UNIFIED WIRELESS NETWORK

Cisco wireless LAN controllers define an innovative architecture for large-scale wireless LANs by considering individual access points as part of a larger system and centralizing certain functions of the 802.11 protocol. Based on the Lightweight Access Point Protocol (LWAPP) and operating as part of this wireless architecture, the Cisco Aironet 1500 Series derives system-level management of device configuration, security policies, and RF parameters while providing Layer 2 or Layer 3 mobility throughout the network (Figure 3). Cisco wireless LAN controllers and Cisco WCS Software provide an easy-to-use, intuitive graphical user interface. A management dashboard displays key network statistics including traffic statistics, link characteristics and client information. SNMP v1, v2c, and v3 support interface to other management platforms. With the Cisco Unified Wireless Network, the same design used for the outdoors can be applied to indoor access points, providing seamless operations throughout the WLAN. Security is ensured through advanced networking features, such as supporting differentiated security policies for different user types or enabling location-based access. The Cisco Unified Wireless Network allows future features for the 1500 Series, such as support for 4.9 GHz operations, to be rolled out very easily by simply updating software at the Controller.

Figure 3. Cisco Unified Wireless Network
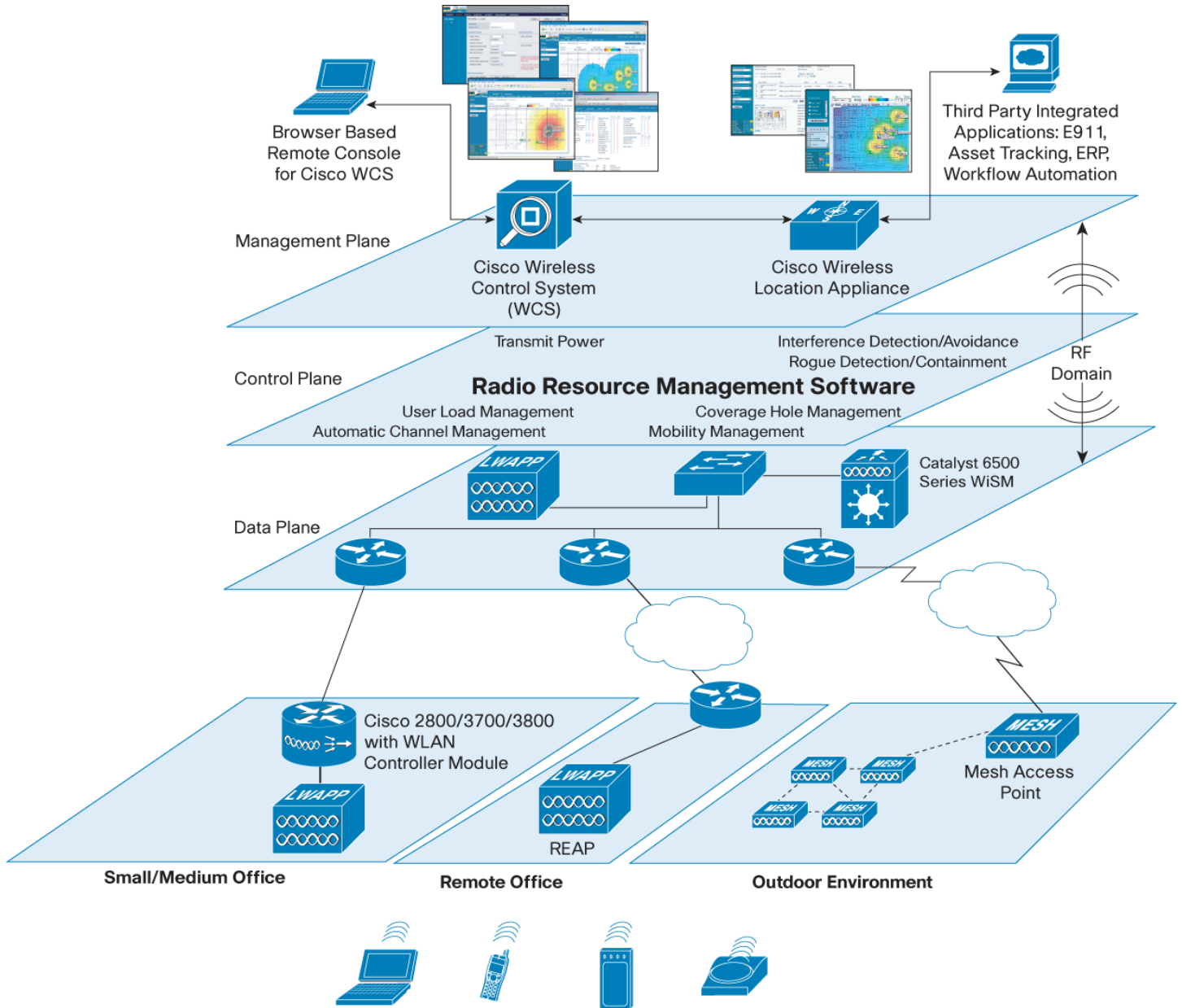
Security standards such as 802.11i Wi-Fi WPA2, WPA, and Wired Equivalent Privacy (WEP) protect the network and client data from malicious activity. X.509 digital certificates authenticate the access point to the network, providing zero-configuration deployment. The wireless network and traffic is secured end to end with hardware-based AES encryption protecting the wireless mesh links from hacking.

APPLICATIONS

The Cisco Aironet 1500 Series is designed to scale to large outdoor deployments. It is ideally suited for metropolitan networks, being easy to install on streetlight posts. The Cisco Aironet 1500 Series can be deployed with zero-configuration required of the mesh access point. Intelligent wireless routing based on the Adaptive Wireless Path Protocol creates a wireless mesh infrastructure that dynamically optimizes the network routes and self-heals from interference or outages, while the Radio Resource Management (RRM) software, a feature of the Cisco Unified Wireless Network, optimizes radio parameters for client access. These automated capabilities reduce deployment and maintenance costs.

Dual, high-powered, high-sensitivity radios, along with a selection of high-gain antennas, allow coverage to be scaled as capacity needs increase. Sixteen broadcast service set identifiers (BSSIDs) create multiple virtual WLANs, allowing segmentation of the network for different user types— such as police, fire, municipal services, or public access—over a single access point. These services extend indoors over the platform-independent architecture, allowing Wi-Fi clients to roam throughout the WLAN, minimizing capital expenditures and management costs.

The Cisco Aironet 1500 Series authenticates clients using the 802.1x authentication protocol, allowing EAP-SIM, Protected EAP (PEAP), Transport Layer Security (TLS), Tunneled TLS (TTLS), and Cisco LEAP types, or allows open authentication. HTTP web page re-direct to a login portal page interfaces to a local authentication database or a public WLAN services gateway, allowing customers to provide guest user access. Hardware-based AES encryption ensures data privacy without compromising performance.

Remote peripherals such as video cameras can be bridged over the Ethernet. A ruggedized outdoor enclosure protects against rain and lightning, and resists wind and vibration from storms or road traffic.

The Cisco Wireless Mesh Networking solution integrates with and extends service provider metropolitan networks. The Metro Ethernet access layer of Cisco's 3750 Ethernet switches provide high-capacity, high-bandwidth services to business customers. Integrating the Cisco Wireless Mesh Networking solution to the metro edge allows service providers to extend data and Wi-Fi broadband service to cities for public safety and municipal service as well as city-wide Hot-Zone access for consumers (Figure 4).

Figure 4. Cisco Aironet 1500 Series in a Metro Ethernet Deployment
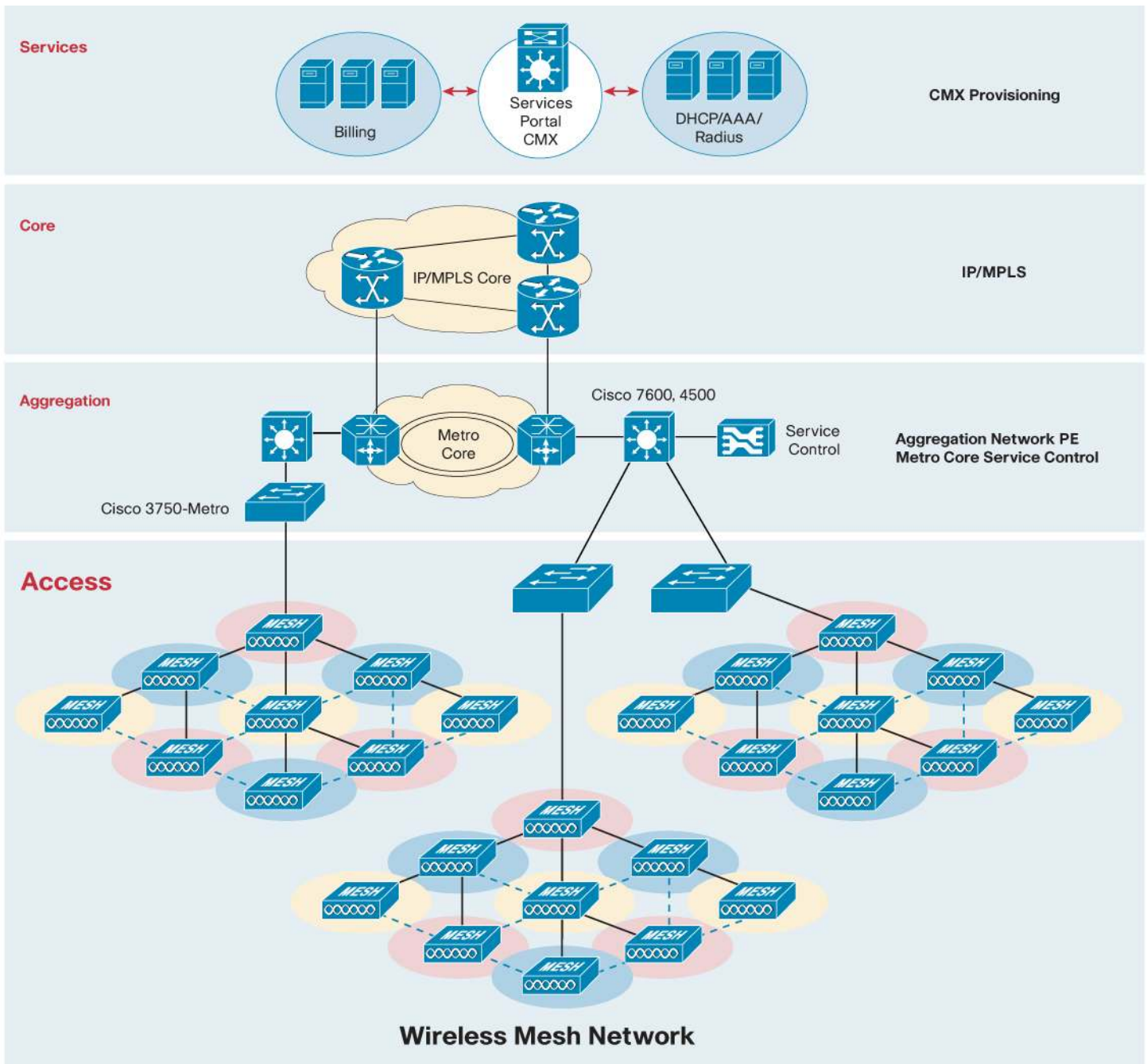
For enterprises, the Cisco Aironet 1500 Series extends the wireless LAN to the outdoors, integrating easily into the existing wireless network architecture. Access points support zero-configuration to provide coverage outside of buildings. Additional coverage can be deployed to more remote locations, with the Adaptive Wireless Path Protocol forming a wireless mesh between nodes.

The Cisco Wireless LAN Controllers and Cisco WCS Software provide an easy-to-use and intuitive graphical user interface for centralized WLAN management. A single architecture crosses between the indoor and outdoor WLAN deployment. With 802.11e Wi-Fi Multimedia (WMM) support, the Cisco 1500 Series is voice-ready for seamless roaming throughout the Enterprise campus. Network integrity and privacy is ensured with 802.11i and WPA2 standards-based security, encrypting from nodes to node with hardware-based AES.

FEATURES AND BENEFITS

Table 1 describes the features and benefits of Cisco Aironet 1500 Series lightweight outdoor mesh access points.

Table 1. Features and Benefits

Feature	Benefit
Patent-Pending Adaptive Wireless Path Protocol	• Forms a wireless mesh network between nodes. • Is designed specifically for a multiradio platform to handle acute environmental interference as well as self-interference, optimizing system-level network performance. • Dynamically optimizes traffic routes between nodes for high network resiliency and high system capacity. • Self-heals from interference or outages, reducing management costs.
Bridging	• Bridges remote networks over wireless in a point-to-point or point-to-multipoint configuration, eliminating leased lines or providing an alternative backhaul. • Allows remote peripherals, such as security cameras, to be bridged to the network.
Integrated, Dual Radio Design	• Provides separate channels for the mesh infrastructure and client access, enabling pico-cellular design, minimizing system interference, and delivering high system capacity. • Complies with 802.11a and 802.11b/g standards for interoperability with any Wi-Fi compliant client. • Single, integrated design simplifies deployment and management.
Standards-Based LWAPP	• Centralizes functions of wireless LANs at Cisco wireless LAN controllers to enable intelligent, system-level device and RF management, security, and mobility across and between subnets. • Provides a consistent WLAN architecture between indoor and outdoor deployments. • Is managed through easy-to-use and intuitive interfaces on Cisco wireless LAN controllers and Cisco WCS Software.
Security	• X.509 digital certification prevents unauthorized devices from joining the wireless mesh network. • Hardware-based AES encrypts access-point-to-access-point traffic to help ensure privacy. • The Cisco wireless LAN controllers define security, for centralized security policy application. • Supports 802.11i, WPA2, and WPA standard security authentication and encryption for interoperability with any Wi-Fi-compliant client. Supported EAP types include SIM, PEAP, TLS, TTLS, and Cisco LEAP.
Zero-Configuration Deployment	• Allows access points to securely join the wireless mesh network without needing to be configured onsite at installation, reducing deployment costs.
Radio Resource Management (RRM)	• Interoperating with software at the Controller to create an intelligent RF plane for self-configuration, self-healing, and self-optimization. • Detects interference from existing, unrelated WLAN access points and adjusts the RF parameters to optimize network performance.
Multiple Broadcast SSIDs	• 16 BSSIDs allow multiple virtual WLANs for different user types and enables wholesale business models.
Web-Authentication	• Interfaces to remediation server to support 3rd party billing platforms.
Power over Ethernet (PoE)	• Can be powered over the same cable that provides Ethernet connectivity, simplifying the need for a nearby AC power source and reducing deployment complexity.

Feature	Benefit
Ruggedized Enclosure	• Reliability in severe weather conditions maximizes network uptime.

SUMMARY

The Cisco Aironet 1500 Series is ideal for outdoor wireless deployments, scaling from enterprise extensions of their indoor wireless LANs to metropolitan-sized deployments. Patent-pending Adaptive Wireless Path Protocol, designed specifically for wireless environments, provides dynamic path optimization and self-healing capabilities, making the Cisco Aironet 1500 Series easy to use and minimizing management costs. Dual radios enable pico-cellular designs, delivering high system capacity.

The Cisco Aironet 1500 Series is part of an innovative centralized wireless LAN architecture. Working with Cisco wireless LAN controllers, management, security, and mobility is enabled centrally, at a systems level. This allows the network to work smoothly across the indoor and outdoor wireless LAN.

Cisco Aironet 1500 Series lightweight outdoor mesh access points deliver industry-leading performance for wireless mesh networking.

PRODUCT SPECIFICATIONS

Table 2 lists specifications for the Cisco Aironet 1500 Series.

Table 2.   Cisco Aironet 1500 Series Product Specifications

Item	Specification		
Wireless Standards	• 802.11a • 802.11b/g		
Media Access Protocol	• Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA)		
Date Rates and Modulation	• 802.11a: 54, 48, 36, 24, 18, 12, 9, 6 Mbps, Orthogonal Frequency Division Multiplexing (OFDM) • 802.11b: 11, 5.5, 2, 1 Mbps, Direct Sequence Spread Spectrum (DSSS) • 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps, OFDM		
Frequency Band and Operating Channels	**Regulatory Version**	**802.11a**	**802.11b/g**
	-A	5.725–5.850 GHz 5 channels	2.412–2.462 GHz 11 channels
	-N	5.725–5.850 GHz 5 channels	2.412–2.462 GHz 11 channels

Item	Specification		
Transmit Power **(Maximum transmit power will vary by channel, data rate, and individual country regulations)**	**Maximum:** • 802.11a: 26 dBm • 802.11b: 24 dBm • 802.11g: 24 dBm		
Receive Sensitivity (Typical)	**802.11a** 6 Mbps: –91 dBm 9 Mbps: –89 dBm 12 Mbps: –89 dBm 18 Mbps: –86 dBm 24 Mbps: –84 dBm 36 Mbps: –80 dBm 48 Mbps: –76 dBm 54 Mbps: –73 dBm	**802.11b** 1 Mbps: –94 dBm 2 Mbps: –94 dBm 5.5 Mbps: –90dBm 11 Mbps: –88 dBm	**802.11g** 6 Mbps: –91 dBm 9 Mbps: –89 dBm 12 Mbps: –89 dBm 18 Mbps: –86 dBm 24 Mbps: –84 dBm 36 Mbps: –80 dBm 48 Mbps: –76 dBm 54 Mbps: –73 dBm
Network Interface	• 802.3u 10/100 Ethernet, autosensing		
Networking Features	• 16 Broadcast SSIDs • HTTP web page re-direct		
Management	• LWAPP-based • Managed by Cisco Wireless LAN Controller		
Security	**Wireless Bridging/Mesh** • X.509 digital certificates • MAC address authentication • Hardware-assisted AES encryption **Wireless Access** • 802.11i • 802.1x authentication, including EAP-SIM, EAP-PEAP, EAP-TLS, EAP-TTLS, Cisco LEAP • Hardware-assisted AES, WPA, Temporal Key Integrity Protocol-Message Identity Check (TKIP-MIC) encryption • VPN passthrough • IPSec, L2TP • MAC address filtering		

Item	Specification
Compliance	**Safety** • UL 60950 • CAN/CSA-C22.2 No. 60950 • IEC 60950 • EN 60950 **Radio Approvals** • FCC Part 15.247, 90.210 • FCC Bulletin OET-65C • RSS-210 • RSS-102 • AS/NZS 4268.2003 **EMI and Susceptibility** • FCC part 15.107, 15.109 • ICES-003 • EN 55022
Dimensions	15.0" x 7.3" x 5.7" (25.4 cm x 18.5 cm x 14.5 cm) (including antenna mount)
Weight	10 lbs. (4.55 kg)
Operating Temperature	• –40 to 55°C (-40 to 131°F)
Storage Temperature	• –50 to 85°C (-58 to 185°F)
Environmental Ratings	• IP66 • NEMA 4
Wind Resistance	• Up to 100 MPH sustaining • Up to 165 MPH gusts
Immunity	• <= 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 • EN60950 Overvoltage Category IV
Power	• 95–260 VAC, 47–63 Hz • Power over Ethernet: 48 VDC, +/–10 percent
Warranty	• 1 year

ORDERING INFORMATION

The Cisco Aironet 1500 Series part numbers distinguish the regulatory domains for which the access points are designed. Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, please visit: http://www.cisco.com/go/aironet/compliance

Table 3 lists the available part numbers.

Table 3. Part Numbers for the Cisco Aironet 1500 Series

Part Number	Description
AIR-LAP1510AG-A-K9	Cisco Aironet 1510AG Lightweight Outdoor Mesh Access Point, FCC configuration
AIR-LAP1510AG-N-K9	Cisco Aironet 1510AG Lightweight Outdoor Mesh Access Point, Non-FCC configuration

ANTENNAS

The Cisco Aironet 1500 Series provides N-type connectors for the 2.4-GHz and 5-GHz antennas. It is certified for use with antenna types up to the gains listed in Table 4.

Table 4. Maximum Allowable Antenna Gains

Frequency Band	Antenna Type	Maximum Gain
2.4 GHz	Omnidirectional	8 dBi
5 GHz	Omnidirectional	7 dBi
5 GHz	Patch	17 dBi

Use with certain antennas requires transmit power to be reduced. Please see the Cisco Aironet 1500 Series Quick Start Guide for power limitations.

Table 5 lists the antennas that are available for ordering from Cisco for the Cisco Aironet 1500 Series.

Table 5. Orderable Antennas for the Cisco Aironet 1500 Series

Part Number	Description
AIR-ANT2455V-N=	2.4 GHz, 5.5 dBi omnidirectional antenna with N connector
AIR-ANT5175V-N=	5 GHz, 7.5 dBi omnidirectional antenna with N connector
AIR-ANT58G10SSA-N	5.8 GHz, 9.5 dBi sector antenna with N connector

Additional antennas not provided by Cisco are listed in the Cisco Aironet 1500 Series Quick Start Guide.

ACCESSORIES

Table 6 lists the accessories that are available for the Cisco Aironet 1500 Series.

Table 6. Cisco Aironet 1500 Series Accessories

Part Number	Description
AIR-ACCPMK1500=	Cisco Aironet 1500 Series pole mount kit
AIR-PWR-ST-LT-TAP=	Cisco Aironet 1500 Series streetlight power tap, 105-260 VAC
AIR-PWRINJ1500=	Cisco Aironet 1500 Series power injector, In: 100–240 VAC, Out: 48 VDC
AIR-ETH1500-150=	Cisco Aironet 1500 Series outdoor Ethernet cable, 150-ft

BUNDLES

Table 7 lists the bundles that are available for the Cisco Aironet 1500 Series. Note that bundles are only available for the FCC configuration of the access point.

Table 7. Cisco Aironet 1500 Series Accessories

Part Number	Description
AIR-LAP1510KITP-A	Cisco Aironet 1500 Series Pole-Top Kit, 2.4 Omni 5 GHz Omni Includes: • Access Point, FCC Configuration (AIR-LAP1510AG-A-K9) • Pole-Mount Kit (AIR-ACCPMK1500) • Streetlight Power Tap (AIR-PWR-ST-LT-TAP) • 2.4 GHz, 5.5 dBi Omnidirectional Antenna with N Connector (AIR-ANT2455V-N) • 4.9–5.8 GHz, 7.5 dBi Omnidirectional Antenna with N Connector (AIR-ANT5175V-N)
AIR-LAP1510KITRO-A	Cisco Aironet 1500 Series Roof-Top Kit, 2.4 Omni 5GHz Omni Includes: • Access Point, FCC Configuration (AIR-LAP1510AG-A-K9) • Power Injector (AIR-PWRINJ1500) • Outdoor Ethernet Cable (AIR-ETH1500-150) • 2.4 GHz, 5.5 dBi Omnidirectional Antenna with N Connector (AIR-ANT2455V-N) • 4.9–5.8 GHz, 7.5 dBi Omnidirectional Antenna with N Connector (AIR-ANT5175V-N)
AIR-LAP1510KITRS-A	Cisco Aironet 1500 Series Roof-Top Kit, 2.4 Omni 5GHz Sector Includes: • Access Point, FCC Configuration (AIR-LAP1510AG-A-K9) • Power Injector (AIR-PWRINJ1500) • Outdoor Ethernet Cable (AIR-ETH1500-150) • 2.4 GHz, 5.5 dBi Omnidirectional Antenna with N Connector (AIR-ANT2455V-N) • 5.8 GHz, 9.5 dBi Sector Antenna with N Connector (AIR-ANT58G10SSA-N)

SERVICE AND SUPPORT

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For more information about Cisco Aironet 1500 Series lightweight outdoor mesh access points, contact your local account representative or visit: http://www.cisco.com/go/wirelessmesh

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