

CISCO AIRONET 1200 SERIES ACCESS POINT



PRODUCT OVERVIEW

The Cisco Aironet[®] 1200 Series IEEE 802.11 a/b/g Access Point sets the enterprise standard for high-performance, secure, manageable, and flexible wireless LANs (WLANs). The modular design of the Cisco Aironet 1200 allows single or dual radio configuration for up to 54 Mbps connectivity in both the 2.4 and 5 GHz bands and is fully compliant with IEEE 802.11a, 802.11b, and 802.11g standards. Providing numerous configuration and upgrade options, the Cisco Aironet 1200 Series supports a variety of clients in mixed frequency and mixed throughput environments. Whether configured for single 802.11a coverage, single 802.11g coverage, 802.11b/g coverage or for tri-mode 802.11a/b/g coverage, the Cisco Aironet 1200 offers the greatest flexibility and investment protection, allowing network administrators to deploy a wireless network optimized for their particular application.

The Cisco Aironet 1200 takes advantage of Cisco IOS[®] Software for ease-of-use and familiarity and is a key component of the Cisco Structured Wireless-Aware Network (SWAN), a comprehensive framework that delivers an integrated, end-to-end wired and wireless network. The Cisco Aironet 1200 Series provides customers with maximum freedom and flexibility, enabling constant connection to all network resources from virtually anywhere wireless access is deployed (Figure 1).

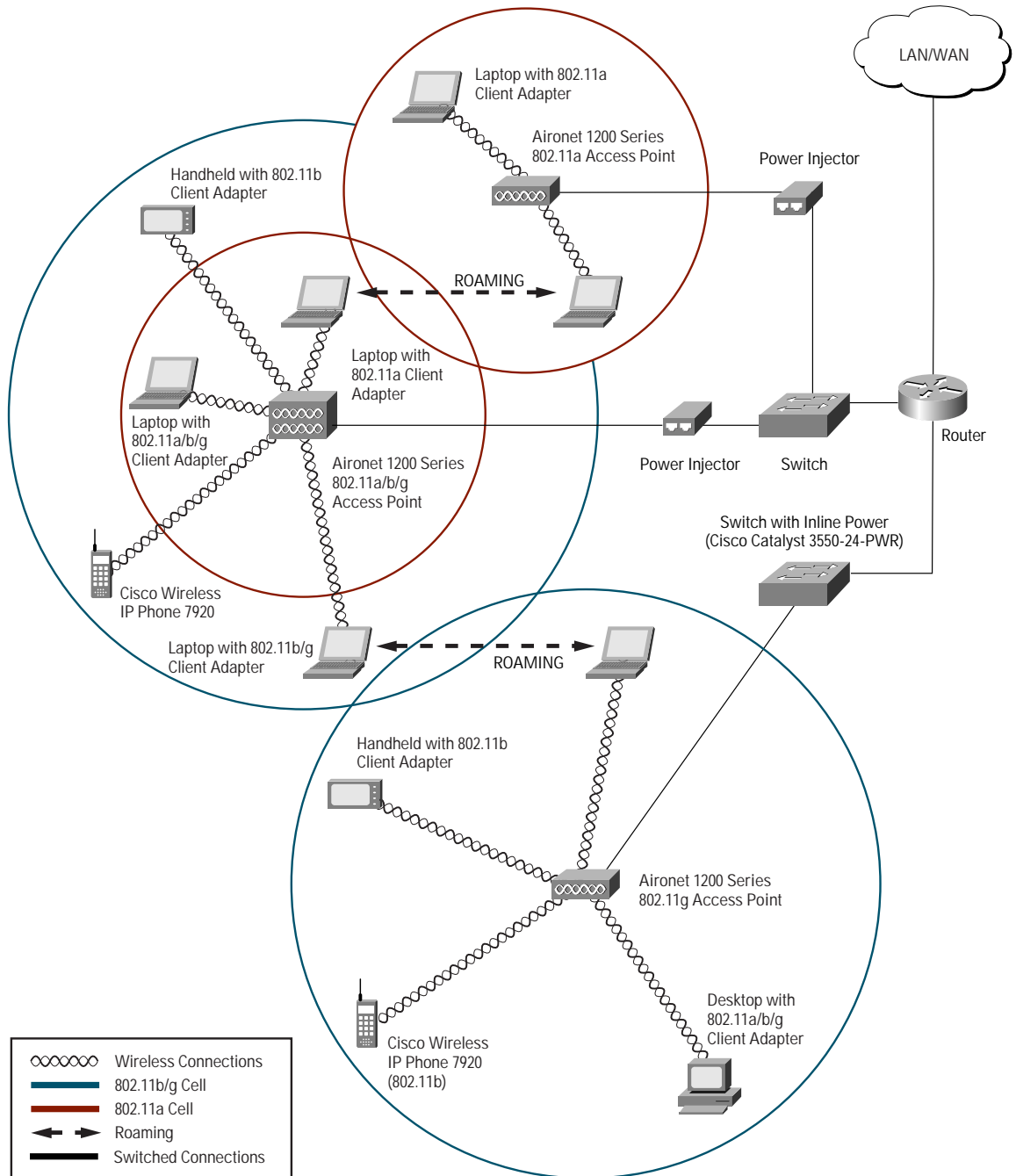
MODULAR DESIGN FOR CUSTOMER-SPECIFIC FUNCTIONALITY AND UPGRADE CAPABILITY FOR INVESTMENT PROTECTION

The Cisco Aironet 1200 Series is specifically designed to protect current and future network infrastructure investments. The 802.11a radio supports data rates of up to 54 Mbps on eight non-overlapping 5 GHz channels to offer high performance as well as maximum capacity and scalability. The 802.11g radio supports data rates up to 54 Mbps in the 2.4 GHz band. When using an 802.11g radio, the access point may be configured to support only 802.11g clients for high-bandwidth applications, or, for added investment protection, it may be configured to support both 802.11g and legacy 802.11b clients.

The 1200 Series provides the flexibility to change capabilities as customer requirements and technologies evolve. CardBus-based 802.11a upgrade modules can be easily installed into Cisco Aironet 1200 Series Access Points originally configured for 802.11b or 802.11g. The 802.11b Mini-PCI radio module in installed Aironet 1200 Series access points can be replaced with an 802.11g upgrade module to provide increased performance with complete backward compatibility.

Figure 1

The Cisco Aironet 1200 can be configured to support 802.11b/g, 802.11a, or all three technologies in a single device. Clients supporting multiple 802.11 standards can roam between access points while maintaining reliable and uninterrupted access to all network resources.

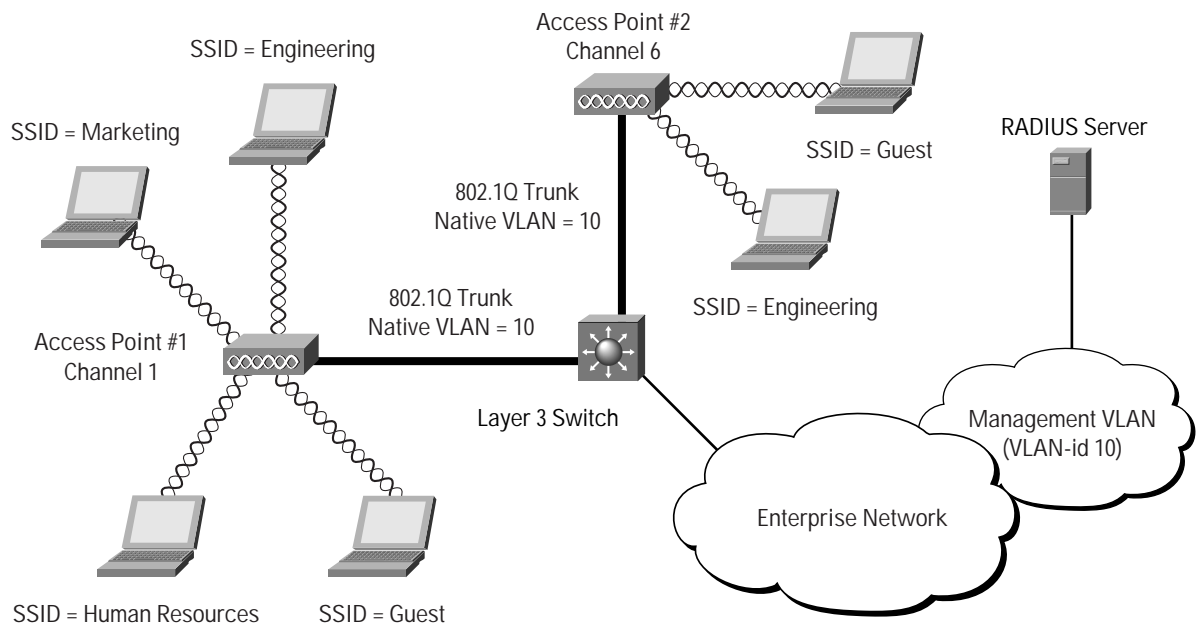


INTELLIGENT NETWORKING FEATURES FOR A SCALABLE, MANAGEABLE SOLUTION

The Cisco Aironet 1200 Series extends end-to-end intelligent networking to the wireless access point. Cisco command-line interface (CLI) allows customers to quickly and consistently implement the extended capabilities available in Cisco IOS Software. Customers can manage and standardize their networks using tools they have developed internally for their Cisco routers and switches.

An ideal choice for enterprise installations, the Cisco Aironet 1200 Series supports enterprise-class virtual LANs (VLANs), quality of service (QoS) and proxy mobile Internet Protocol (IP). The Cisco Aironet 1200 Series can manage up to 16 VLANs in single-mode or dual-mode operation (Figure 2), which allows customers to differentiate LAN policies and services—such as security and QoS—for different users. For example, enterprise customers can use different VLANs to segregate employee traffic from guest traffic, and further segregate those traffic groups from high-priority voice traffic. Traffic to and from wireless clients with varying security capabilities can be segregated into VLANs with varying security policies. For example, VLANs allow educational institutions to secure faculty and administrator traffic from student traffic traveling over the same infrastructure. Implementing VLAN segmentation increases wireless LAN manageability and security.

Figure 2
Indoor Wireless VLAN Deployment



With support for IEEE 802.1p QoS, the Cisco Aironet 1200 Series provides traffic prioritization for packets traveling to and from the access point over Ethernet. Delay-sensitive traffic, such as voice and video, can be prioritized over data traffic for improved user experience and optimal network utilization. Software and radio firmware upgrades allow upgrade to future QoS standards such as IEEE 802.11e. Supporting the voice prioritization schemes for 802.11b mobile phones, the Aironet 1200 Series further enables quality voice-over-wireless-LAN solutions.

With proxy mobile IP, users can maintain seamless network connectivity as they roam across subnets. The proxy mobile IP feature creates a tunnel between routers on the remote network and the user's home network. This allows users to consistently maintain their home IP address and access to their home network applications as they roam

beyond their home subnet. Proxy mobile IP also enhances a mobile IP-enabled network by enabling subnet roaming capabilities on IEEE 802.11 clients so that these devices do not need specialized mobile IP client software, resulting in cost-savings. These proxy mobile IP features allow IT professionals to use their existing IP addressing scheme to cost-effectively design the wireless LAN in a manner more consistent with the wired LAN, while still maintaining user mobility.

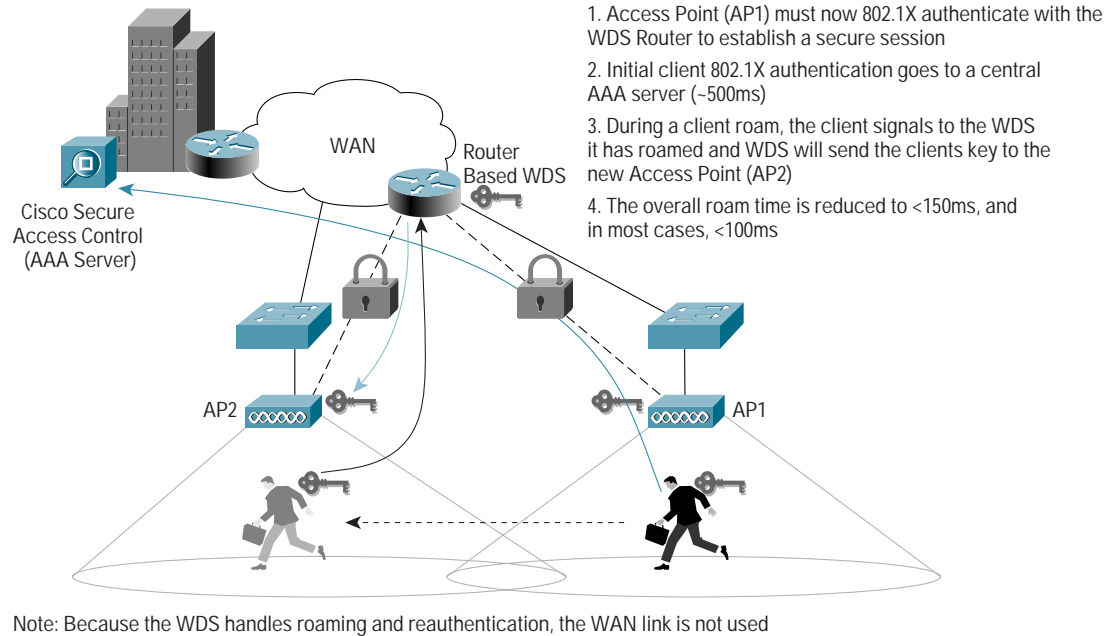
CISCO STRUCTURED WIRELESS-AWARE NETWORK

The Cisco Aironet 1200 Series is a key component of Cisco SWAN—an innovative, comprehensive Cisco framework for deploying, operating and managing hundreds to thousands of Cisco Aironet access points using the Cisco infrastructure. Cisco SWAN provides the wireless LAN with the same level of security, scalability, and reliability that customers have come to expect in their wired LAN by introducing “wireless-aware” capabilities into the Cisco infrastructure.

To take advantage of the innovative features of the 1200 Series, not only can Cisco client adapters be used, but now a wide variety of Cisco Compatible devices are available from leading WLAN client suppliers. For example, wireless domain services (WDS) was introduced with Cisco SWAN. WDS is a collection of Cisco IOS Software features that enhance WLAN client mobility and simplify WLAN deployment and management. These services—currently supported on access points and client devices and scheduled to be supported on specific Cisco LAN switches and routers in 2004—include radio management aggregation, fast secure roaming, and WAN link remote site survivability. WDS radio management aggregation supports radio frequency (RF) managed services such as rogue access point detection, interference detection and assisted site surveys.

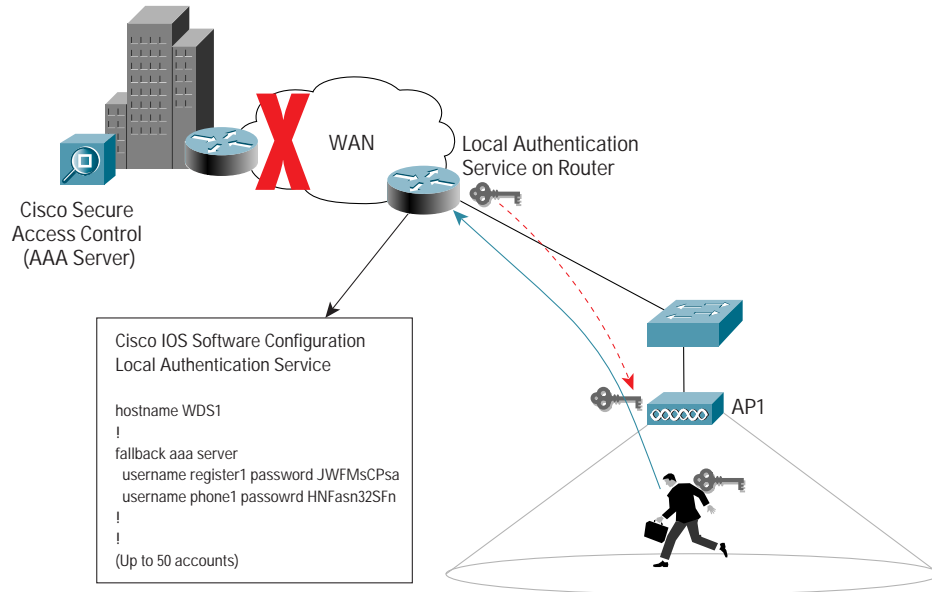
Fast secure roaming is supported by the Cisco Aironet 1200 Series in conjunction with Cisco and Cisco Compatible client devices. With fast secure roaming, authenticated client devices can roam securely from one access point to another without any perceptible delay during reassociation. Fast secure roaming supports latency-sensitive applications such as wireless voice over IP (VoIP), enterprise resource planning (ERP), or Citrix-based solutions (Figure 3).

Figure 3
Fast Secure Roaming



WAN link remote site survivability allows the access point to act as a local RADIUS server to IEEE 802.1X authenticate wireless clients when the authentication, authorization, and accounting (AAA) server is not available. This provides remote site survivability and backup authentication services during a WAN link or server failure, allowing users in remote site deployments with nonredundant WAN links access to local resources such as file servers or printers (Figure 4).

Figure 4
WAN Link Remote Site Survivability



ENTERPRISE-CLASS SECURITY SOLUTION

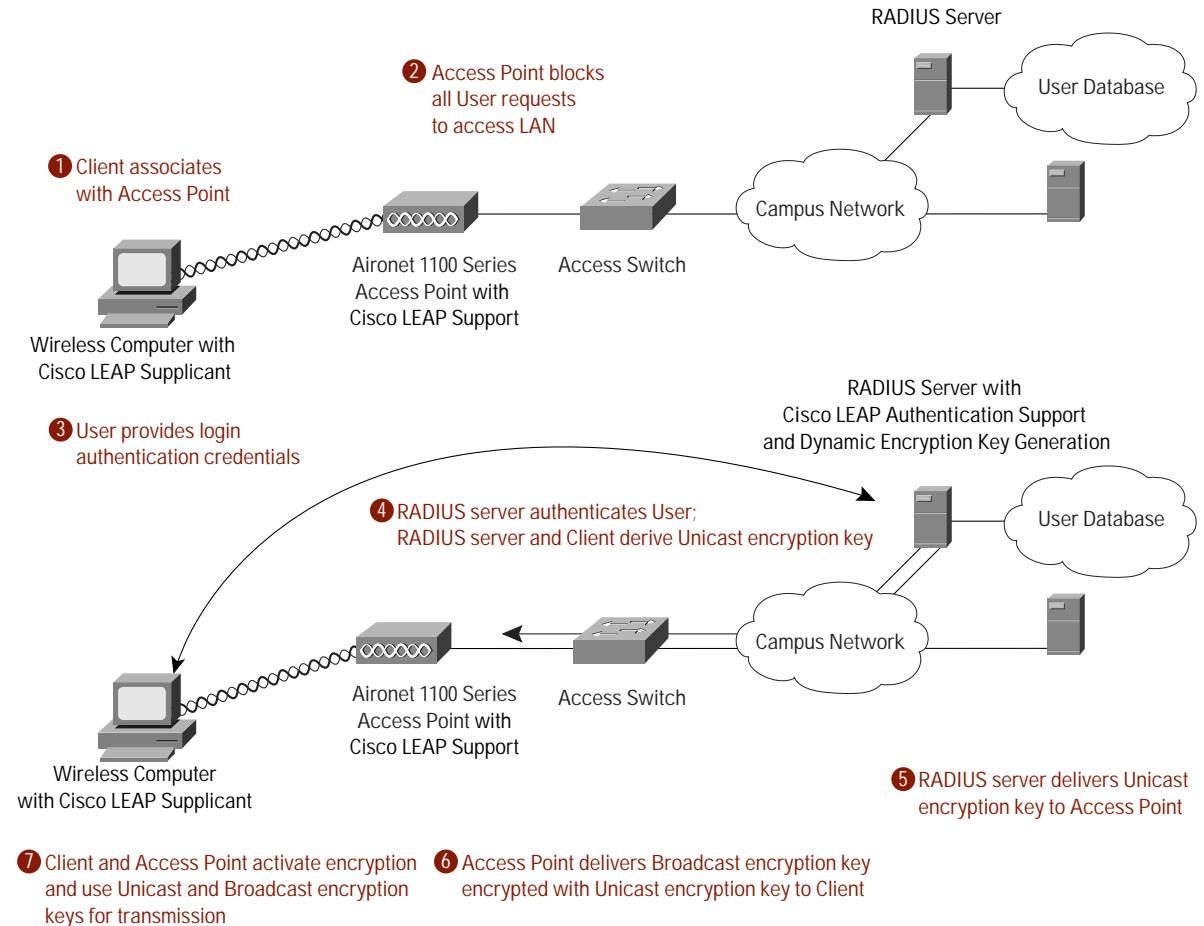
Wireless LAN security is a primary concern. The Cisco Aironet 1200 Series secures the enterprise network with a scalable and manageable system featuring the award-winning Cisco Wireless Security Suite. Based on the IEEE 802.1X standard for port-based network access, the Cisco Wireless Security Suite takes advantage of the Extensible Authentication Protocol (EAP) framework for user-based authentication (Figure 5). This solution also supports Wi-Fi Protected Access (WPA), the new Wi-Fi Alliance specification for interoperable, standards-based wireless LAN security.

The Cisco Wireless Security Suite interoperates with a range of client devices. It supports all 802.1X authentication types, including Cisco LEAP, Extensible Authentication Protocol-Transport Layer Security (EAP-TLS) and types that operate over EAP-TLS, such as Protected Extensible Authentication Protocol (PEAP), EAP-Tunneled TLS (EAP-TTLS) and EAP-Subscriber Identity Module (EAP-SIM). A wide selection of RADIUS servers, such as the Cisco Secure Access Control Server (ACS), can be used for enterprise-class centralized user management that includes:

- Strong, mutual authentication to ensure that only legitimate clients associate with legitimate and authorized network RADIUS servers via authorized access points
- Dynamic per-user, per-session encryption keys that automatically change on a configurable basis to protect the privacy of transmitted data
- Stronger encryption provided by Temporal Key Integrity Protocol (TKIP) enhancements such as message integrity check (MIC), per-packet keys via initialization vector hashing, and broadcast key rotation
- 802.11g version is ready for Advanced Encryption Standard (AES) support
- RADIUS accounting records for all authentication attempts

Figure 5

The Cisco Wireless Security Suite is an enterprise-class security system based on the 802.1X architecture



INVESTMENT PROTECTION FOR FUTURE-PROOF NETWORKS

With large storage capacity and support for Cisco management tools, the Cisco Aironet 1200 Series provides the capacity and the means to upgrade firmware and deliver new features as they become available. It features more than twice the amount of storage required by the initial Cisco IOS firmware load and the tools for IS professionals to centrally and automatically upgrade firmware on often remote access points across the enterprise. For additional investment protection, the Cisco Aironet 1200 Series comes complete with an integrated mounting system that secures the device using the customer's choice of laptop security cables or standard padlocks (Figure 6). The reliability of the 2.4 GHz solution also makes the Cisco Aironet 1200 Series a wise investment for enterprise customers. It provides field-proven reliability, featuring a Cisco Aironet fifth-generation 2.4 GHz radio. The 5 GHz radio maximizes capacity and performance, delivering up to 54 Mbps data rates on all eight available channels and allowing the wireless network to scale to accommodate a large number of users. With the Cisco Aironet 1200 Series, a single access point can add capacity to support new users by simultaneously operating one radio for 802.11a networked clients while maintaining another radio for 802.11b or 802.11b/g clients. The redundant hot-standby feature also aids in the overall reliability of the network by providing a backup access point in the rare case of a failure.

Figure 6
Cisco Aironet 1200 Series Mounting Bracket



INSTALLATION OPTIONS INCREASE FLEXIBILITY

As the popularity of wireless LANs increases, enterprises are installing access points in a growing variety of facilities, locations, and orientations. The Cisco Aironet 1200 Series is designed with this in mind. With its broad operating temperature range, the cast aluminum-cased device provides the ruggedness required in factories and warehouse installations while still meeting the aesthetic requirements of the enterprise. Support for both inline power over Ethernet, as well as local power, maximizes powering options. The access point and integrated mounting system are designed for installation on walls, below ceilings, and, with its plenum ratable metal case, above suspended ceilings. All three radios (802.11a, 802.11b, and 802.11g) provide a variety of transmit power settings to adjust coverage area size. This, coupled with the broadest selection of 2.4 GHz and integrated 5 GHz antennas in the industry, provides users with unparalleled flexibility in cell size and coverage patterns.

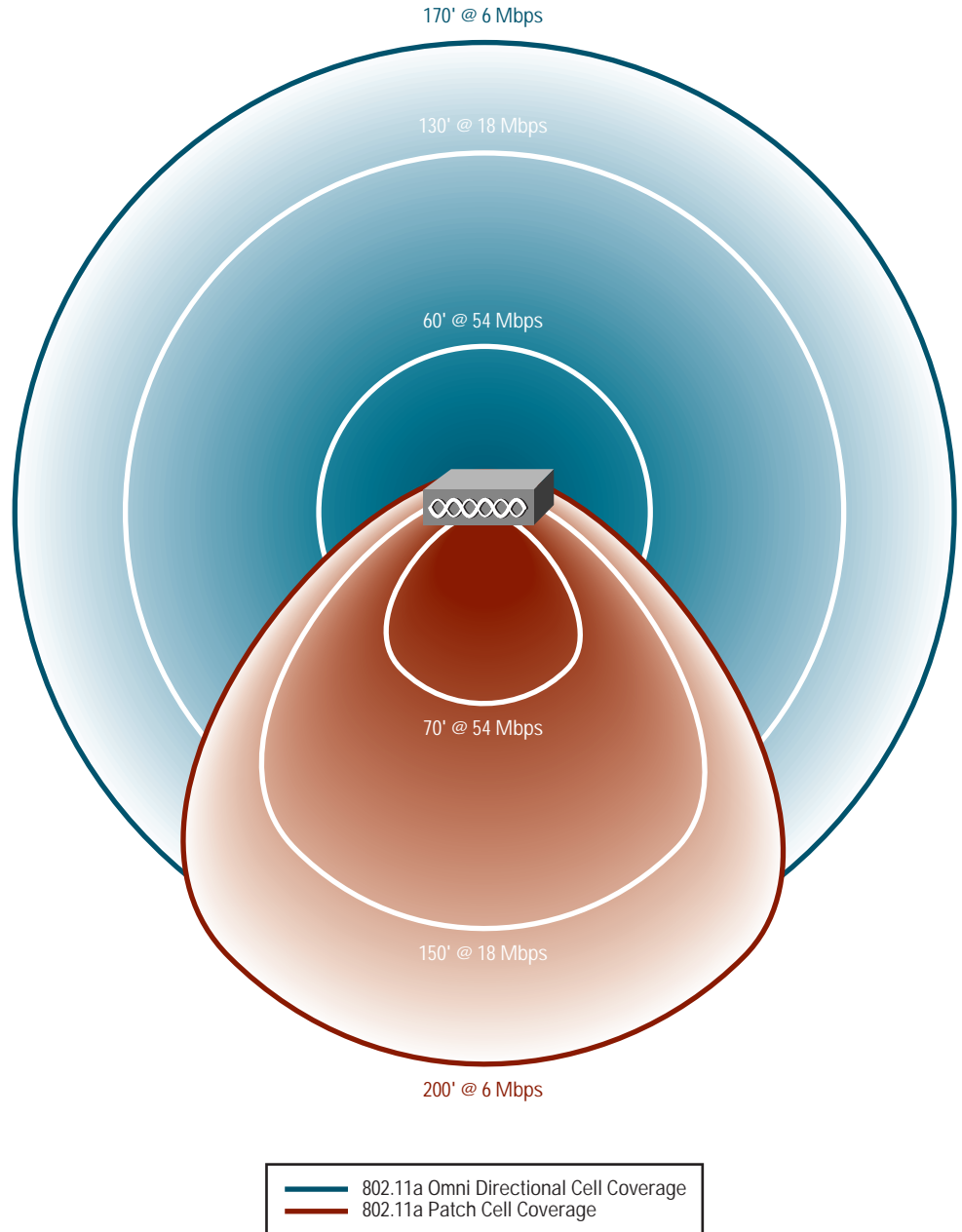
UNIQUE 802.11A 5 GHZ ANTENNA DESIGN FOR OPTIMAL COVERAGE

To extend the flexibility of deployments, the 802.11a radio module incorporates an articulating antenna paddle that contains both omni-directional and patch antennas (Figure 7). For ceiling, desktop, or other horizontal installations, the omni-directional antenna provides optimal coverage pattern and maximum range. For wall mount installations, the patch antenna provides a hemispherical coverage pattern that uniformly directs the radio energy from the wall and across the room (Figure 8). Both the omni-directional and patch antennas provide diversity for maximum reliability even in high multipath environments such as offices and other indoor environments. Cisco provides this level of 5 GHz antenna flexibility and reliability to suit all installation scenarios.

Figure 7
Integrated Omni-Directional and Patch Antenna Featured in the 802.11a Radio Module



Figure 8
Innovative Antenna design Provides Two Distinct Coverage Patterns for Different Installation Orientations.



INTEGRATED MANAGEMENT TOOLS FOR RAPID CONFIGURATION

The Cisco Aironet 1200 Series simplifies wireless LAN management because many of the same management tools and capabilities available in wired networks are used on the wireless network (Figure 9). The 1200 Series supports network management through Cisco IOS Software CLI, which is familiar to IT professionals and makes use of their existing skills. It also supports Simple Network Management Protocol (SNMP), Telnet, and a Web browser to aid in troubleshooting, monitoring, software download, and event logging.

Figure 9

The Aironet 1200 Series management system Express Setup screen provides all the settings required for basic configuration of the access point.

HOME Hostname: ap ap uptime is 4 days, 21 hours, 37 minutes

EXPRESS SETUP

NETWORK MAP

ASSOCIATION

NETWORK INTERFACES

SECURITY

SERVICES

SYSTEM SOFTWARE

EVENT LOG

Express Set Up

System Name: ap

MAC Address: 0005.9a30.42c0

Configuration Server Protocol: DHCP Static IP

IP Address: 10.91.6.158

IP Subnet Mask: 255.255.255.192

Default Gateway: 10.91.6.129

SNMP Community: defaultCommunity

Read-Only Read-Write

Radio0.002.110

SSID: Multiple SSIDs are set and must be edited with [Secure SSID](#)

Role in Radio Network: Access Point Root Repeater Non-Root

Optimize Radio Network for: Throughput Range Custom

Aironet Extensions: Enable Disable

Radio1.002.11A

SSID: Multiple SSIDs are set and must be edited with [Secure SSID](#)

Role in Radio Network: Access Point Root Repeater Non-Root

Optimize Radio Network for: Throughput Range Default Custom

Aironet Extensions: Enable Disable

Apply Cancel

ADVANCED MANAGEMENT OF LARGE SCALE WIRELESS LAN DEPLOYMENTS

The CiscoWorks Wireless LAN Solution Engine (WLSE), a component of the Cisco SWAN, is available as a management tool for Cisco Aironet access points and wireless bridges. CiscoWorks WLSE is a turnkey, scalable, and centralized management platform for managing hundreds to thousands of Cisco Aironet access points and wireless bridges. Read more about CiscoWorks WLSE at: <http://www.cisco.com/go/wlse>

Table 1 provides product features and benefits, Table 2 provides product specifications, and Table 3 provides product system requirements for the Cisco Aironet 1200 Series.

Table 1 Product Features and Benefits

Feature	Benefit
Modular, Dual Radio Platform for Single, Dual or Tri-mode Operation	Flexibility and investment protection is provided with an easily configurable wireless LAN access point platform. Varying speed and capacity requirements can be accommodated as bandwidth requirements and budgets allow. In a single configuration, the Cisco Aironet 1200 requires an 802.11b, 802.11g or an 802.11a radio. When deployed with a single 802.11g radio, the access point may be configured to support only 802.11g clients to optimize network performance. For complete backward compatibility, the access point may be configured to simultaneously support both 802.11g and legacy 802.11b clients. A dual radio configuration is required for tri-mode support of 802.11a/b/g networks. Deploying both an 802.11g and an 802.11a radio in the same access point allows the maximum number of channels and maximum available data rates in a single device.
5 GHz Integrated Antennas	Unique articulating antenna paddle incorporates high-gain omni-directional and hemispherical patch antennas to deliver two distinct coverage patterns.
2.4- and 5 GHz Diversity Antennas	Diversity antennas for both the 2.4- and 5 GHz radios ensure optimum performance in high-multipath environments such as offices, warehouses, and other indoor installations.
Cisco IOS Software	Provides end-to-end solution support for intelligent network services. Produces predictable and consistent network behavior with uniform applications and services.
Virtual LAN (VLAN) Support	Allows segmentation of up to 16 user groups, creating increased system flexibility by allowing differentiation of LAN policies and services, such as security and QoS, for different users.
Downstream QoS Support	Prioritization of traffic based on 802.1p tags for different application requirements to improve the voice and video user experience.
Proxy Mobile IP	Provides seamless roaming between subnets and enhances mobility of voice over 802.11 wireless.
Cisco SWAN	A comprehensive Cisco framework for deploying, operating and managing hundreds to thousands of Cisco Aironet access points using the Cisco infrastructure. This framework extends to the wireless LAN the same level of security, scalability, and reliability that customers have come to expect in their wired LAN by introducing "wireless-aware" capabilities into the Cisco infrastructure.
Wireless Domain Services (WDS)	A component of Cisco SWAN, WDS is a collection of Cisco IOS Software features that enhance WLAN client mobility and simplify WLAN deployment and management. WDS includes radio management aggregation, fast secure roaming, and WAN link remote site survivability.

Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Fast Secure Roaming	Allows authenticated client devices to roam securely from one access point to another without any perceptible delay during reassociation. Provides support for latency-sensitive applications such as VoIP, ERP and Citrix.
WAN Link Remote Site Survivability	Allows the access point to act as a local RADIUS server to IEEE 802.1X authenticate wireless clients when the AAA server is not available. Provides remote site survivability and backup authentication services during WAN link or server failure.
Client ARP Caching	Allows Cisco Aironet access points to respond to Address Resolution Protocol (ARP) requests on behalf of IEEE 802.11 Cisco Aironet, Cisco compatible extensions, and most Wi-Fi certified wireless client devices. This enables IP address resolution without requiring the wireless client device to leave power-save or idle modes, which extends battery life.
RADIUS Server per SSID	Allows specification of RADIUS servers on a per-SSID basis by taking advantage of access point multiple SSID capabilities. This is beneficial for multi-tenant deployments, such as airports, where each tenant desires a separate RADIUS server for user authentication.
Two RP-TNCs for External 2.4 GHz Antenna Connection	Diversity support for the 2.4 GHz radio to improve reliability in high-multipath environments. The reverse-polarity threaded navel connectors (RP-TNC) are compatible with the Cisco Aironet optional antennas, enabling WLAN architects to customize radio coverage for specific deployment scenarios.
Eight MB Flash Memory	Provides eight MB of memory space for future firmware upgrades and supports new 802.11 standards and advanced features.
Support for Cisco Discovery Protocol and Software Image Manager (SWIM) within CiscoWorks Resource Essentials (RME)	Allows centralized and automatic firmware upgrades on remote access points across the enterprise.
802.11b mini-PCI radio with 100-mW maximum transmit power and 85-dBm receive sensitivity at 11 Mbps data rate	2.4 GHz radio offers superior radio performance and industry-leading range. The greater the range of the access point, the fewer access points needed, resulting in lower total system cost.
802.11g mini-PCI radio with 100-mW maximum transmit power and 72-dBm receive sensitivity at 54 Mbps data rate	2.4 GHz, 802.11g radio offers 54 Mbps throughput for high-density and high-bandwidth requirements—it may also be configured to simultaneously support legacy 802.11b equipment. Customers with Cisco Aironet 1100 and 1200 Series access points can easily and cost effectively upgrade 802.11b radios to 802.11g radios for high performance 54 Mbps connectivity
802.11a radio module provides 40-mW maximum transmit power for UNII 1 and UNII2 bands and -68 dBm (typical) receive sensitivity at 54 Mbps data rate	Superior 5 GHz radio design provides industry-leading performance and receive sensitivity and maximum capacity through eight non-overlapping channels in the UNII1 and UNII 2 bands.

Table 1 Product Features and Benefits (Continued)

Feature	Benefit
Support for both line power over Ethernet and local power (see Figures 10, 11, and 12)	To decrease the cost and complexity of installation, the Cisco Aironet 1200 Series can be powered over an Ethernet cable, eliminating the need to run expensive AC power to remote access-point installation locations. Depending upon radio configuration, the Cisco 1200 Series can be powered via Cisco line-power-enabled switches, multiport midspan power panels, or single-port power injectors. In instances where AC power is available at the installation location, the power supply for the Cisco Aironet 1200 Series can be plugged into an electrical outlet.
Attractive cast aluminum case, Underwriters Laboratories (UL) 2043 certification, and extended operating temperature (-20– 55 Cor - 4–131 F)	The product design meets the aesthetic requirements of the enterprise and the rugged features support deployment in factories, warehouses, and the outdoors (in a NEMA enclosure). The broad operating temperature range and UL 2043 certification for plenum rating requirements set by local fire codes supports installation in environmental air spaces such as areas above suspended ceilings.
Multipurpose Mounting Bracket	Flexibility of the multipurpose mounting bracket gives numerous deployment options for site-specific requirements.
Two separate locking mechanisms for the access point and radio	Theft deterrence has become a requirement as wireless LANs proliferate into public areas. Additional investment protection is provided with built-in locking mechanisms.

Figure 10

When configured with an 802.11a radio (either single or dual radio), the Cisco Aironet 1200 Series can be powered over Ethernet with the optional inline power injector or the Cisco Catalyst® 3550 Series Switch.

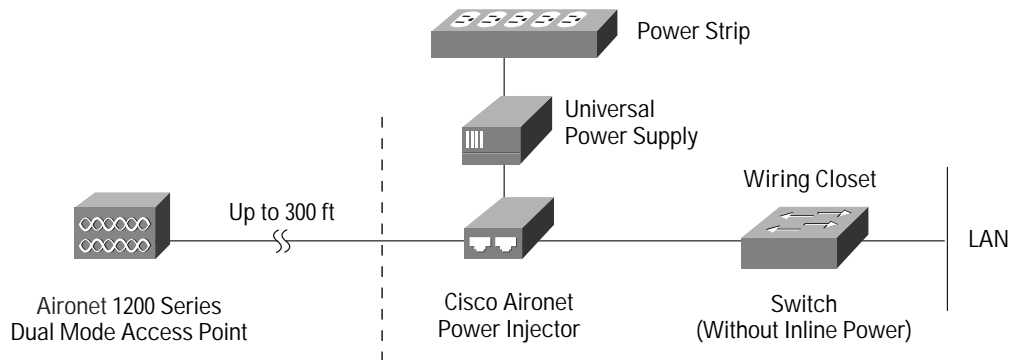


Figure 11

When configured with an 802.11b or 802.11g radio, the Cisco Aironet 1200 can use a Cisco Catalyst 3550-24 PWR switch, or Catalyst 4500 or 6500 Series switch with inline power for its power over Ethernet

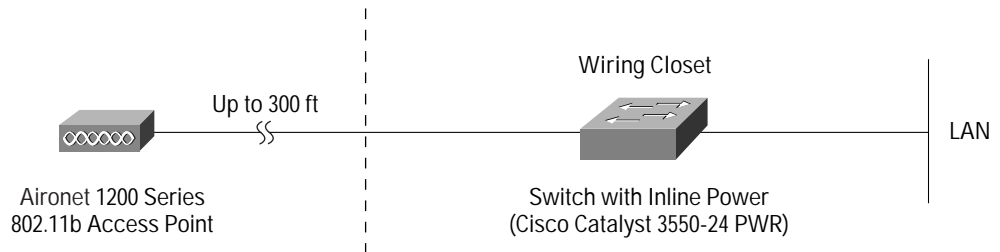


Figure 12

When configured with an 802.11b or 802.11g radio, a Cisco Catalyst Inline Power Patch Panel can be used to power the access point over Ethernet.

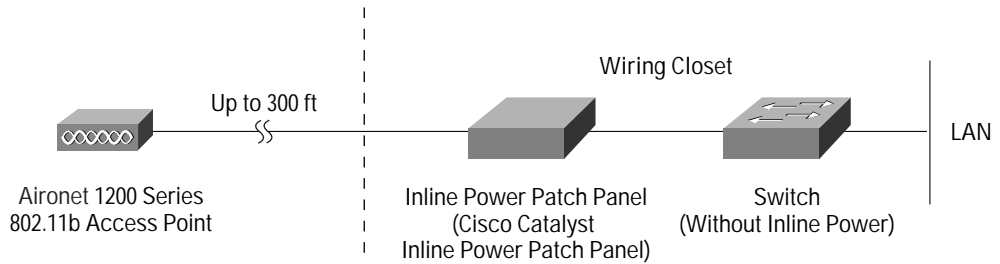


Table 2 Product Specifications

	With 802.11a Radio Installed	With 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted	With both 802.11a and 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted
Part Number	<p>Configurable:</p> <ul style="list-style-type: none"> • Cisco IOS Software: AIR-AP1210 and AIR-RM20A-x-K9 • VxWorks Software: AIR-AP1200 and AIR-RM20A-x-K9 <p>Pre-Configured:</p> <ul style="list-style-type: none"> • Cisco IOS Software: AIR-AP1230A-x-K9 • VxWorks Software: AIR-AP1220A-x-K9 <p>Regulatory Domains: (x=Regulatory Domain)</p> <ul style="list-style-type: none"> • A=Americas, parts of Asia and Europe • S=Singapore • T=Taiwan • J=TELEC (Japan) <p>Customers are responsible for verifying approval for use in their country. Please see http://www.cisco.com/go/aironet/compliance to verify approval and to identify the regulatory domain that corresponds to a particular country. Not all regulatory domains have been approved. As they are approved, the part numbers will be available on the Global Price List.</p>	<p>Configurable:</p> <ul style="list-style-type: none"> • Cisco IOS Software: AIR-AP1210 and AIR-MP21G-x-K9 <p>Pre-Configured:</p> <ul style="list-style-type: none"> • Cisco IOS Software: AIR-AP1231G-x-K9 <p>Regulatory Domains: (x=Regulatory Domain)</p> <ul style="list-style-type: none"> • A=Americas, parts of Asia and Europe • E=ETSI • I=Israel • J= TELEC (Japan) <p>Customers are responsible for verifying approval for use in their country. Please see http://www.cisco.com/go/aironet/compliance to verify approval and to identify the regulatory domain that corresponds to a particular country. Not all regulatory domains have been approved. As they are approved, the part numbers will be available on the Global Price List.</p>	<p>Configurable:</p> <ul style="list-style-type: none"> • Cisco IOS Software: AIR-AP1210, AIR-RM20A-x-K9 and AIR-MP21G-x-K9 <p>Pre-Configured:</p> <ul style="list-style-type: none"> • Cisco IOS Software: AIR-AP1231G-x-K9 and AIR-RM20A-x-K9 <p>Regulatory Domains: (x=Regulatory Domain)</p> <ul style="list-style-type: none"> • A=Americas, parts of Asia and Europe • E=ETSI • I=Israel • J= TELEC (Japan) • S=Singapore • T=Taiwan <p>Customers are responsible for verifying approval for use in their country. Please see http://www.cisco.com/go/aironet/compliance to verify approval and to identify the regulatory domain that corresponds to a particular country. Not all regulatory domains have been approved. As they are approved, the part numbers will be available on the Global Price List.</p>
Radio Module Form Factor	CardBus (32-bit)	Mini-PCI (32-bit)	<ul style="list-style-type: none"> • 802.11a: CardBus (32-bit) • 802.11b or 802.11g: Mini-PCI (32-bit)
Data Rates Supported	6, 9, 12, 18, 24, 36, 48, 54 Mbps	<ul style="list-style-type: none"> • 802.11b: 1, 2, 5.5, 11 Mbps • 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps 	<ul style="list-style-type: none"> • 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps • 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps
Network Standard	<ul style="list-style-type: none"> • IEEE 802.11a 	<ul style="list-style-type: none"> • IEEE 802.11b or IEEE 802.11g 	<ul style="list-style-type: none"> • IEEE 802.11a • IEEE 802.11b or IEEE 802.11g
Uplink	<ul style="list-style-type: none"> • Autosensing 802.3 10/100BASE-T Ethernet 	<ul style="list-style-type: none"> • Autosensing 802.3 10/100BASE-T Ethernet 	<ul style="list-style-type: none"> • Autosensing 802.3 10/100BASE-T Ethernet

Table 2 Product Specifications (Continued)

	With 802.11a Radio Installed	With 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted	With both 802.11a and 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted
Frequency Band	<ul style="list-style-type: none"> 802.11a: <ul style="list-style-type: none"> 5.15 to 5.35 GHz (FCC UNII 1 and UNII 2) 5.15 to 5.25 GHz (TELEC) 5.15 to 5.25 GHz (Singapore) 5.25 to 5.35 GHz (Taiwan) 	<ul style="list-style-type: none"> 802.11b: <ul style="list-style-type: none"> 2.412 to 2.462 GHz (FCC) 2.412 to 2.472 GHz (ETSI) 2.412 to 2.484 GHz (TELEC) 2.432 to 2.447 GHz (Israel) 802.11g: <ul style="list-style-type: none"> 2.412 to 2.462 GHz (FCC) 2.412 to 2.472 GHz (ETSI) 2.412 to 2.484 GHz CCK: (TELEC) 2.412 to 2.472 GHz OFDM: (TELEC) 2.432 to 2.447 GHz (Israel) 	<ul style="list-style-type: none"> 802.11a: <ul style="list-style-type: none"> 5.15 to 5.35 GHz (FCC UNII 1 and UNII 2) 5.15 to 5.25 GHz (TELEC) 5.15 to 5.25 GHz (Singapore) 5.25 to 5.35 GHz (Taiwan) 802.11b: <ul style="list-style-type: none"> 2.412 to 2.462 GHz (FCC) 2.412 to 2.472 GHz (ETSI) 2.412 to 2.484 GHz (TELEC) 2.432 to 2.447 GHz (Israel) 802.11g: <ul style="list-style-type: none"> 2.412 to 2.462 GHz (FCC) 2.412 to 2.472 GHz (ETSI) 2.412 to 2.484 GHz CCK: (TELEC) 2.412 to 2.472 GHz OFDM: (TELEC) 2.432 to 2.447 GHz (Israel)
Network Architecture Type	Infrastructure, star topology	Infrastructure, star topology	Infrastructure, star topology
Wireless Medium	<ul style="list-style-type: none"> Orthogonal Frequency Division Multiplexing (OFDM) 	<ul style="list-style-type: none"> 802.11g: Orthogonal Frequency Division Multiplexing (OFDM) and Direct sequence spread spectrum (DSSS) 802.11b: Direct sequence spread spectrum (DSSS); 	<ul style="list-style-type: none"> 802.11a: Orthogonal Frequency Division Multiplexing (OFDM) 802.11b or 802.11g: Direct sequence spread spectrum (DSSS); Orthogonal Frequency Division Multiplexing (OFDM)
Media Access Protocol	<ul style="list-style-type: none"> Carrier sense multiple access with collision avoidance (CSMA/CA) 	<ul style="list-style-type: none"> Carrier sense multiple access with collision avoidance (CSMA/CA) 	<ul style="list-style-type: none"> Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation	<ul style="list-style-type: none"> (OFDM subcarrier) BPSK @ 6 and 9 Mbps QPSK @ 12 and 18 Mbps 16-QAM @ 24 and 36 Mbps 64-QAM @ 48 and 54 Mbps 	<p>802.11b</p> <ul style="list-style-type: none"> DSSS: <ul style="list-style-type: none"> DBPSK @ 1 Mbps DQPSK @ 2 Mbps CCK @ 5.5 and 11 Mbps <p>802.11g</p> <ul style="list-style-type: none"> OFDM: <ul style="list-style-type: none"> BPSK @ 6 and 9 Mbps QPSK @ 12 and 18 Mbps 16-QAM @ 24 and 36 Mbps 64-QAM @ 48 and 54 Mbps DSSS: <ul style="list-style-type: none"> DBPSK @ 1 Mbps DQPSK @ 2 Mbps CCK @ 5.5 and 11 Mbps 	<ul style="list-style-type: none"> OFDM: <ul style="list-style-type: none"> BPSK @ 6 and 9 Mbps QPSK @ 12 and 18 Mbps 16-QAM @ 24 and 36 Mbps 64-QAM @ 48 and 54 Mbps DSSS: <ul style="list-style-type: none"> DBPSK @ 1 Mbps DQPSK @ 2 Mbps CCK @ 5.5 and 11 Mbps

Table 2 Product Specifications (Continued)

	With 802.11a Radio Installed	With 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted	With both 802.11a and 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted
Operating channels	<ul style="list-style-type: none"> • 5 GHz Band: <ul style="list-style-type: none"> – FCC: 8 – Japan (TELEC): 4 – Singapore: 4 – Taiwan: 4 	<ul style="list-style-type: none"> • 2.4 GHz Band: <ul style="list-style-type: none"> – 802.11b: ETSI: 13; Israel: 4; Americas: 11; TELEC (Japan): 14 – 802.11g: ETSI: 13; Israel: 4; Americas: 11; Japan (TELEC): 14 CCK, 13 OFDM 	<ul style="list-style-type: none"> • 5 GHz Band: <ul style="list-style-type: none"> – FCC: 8 – Japan (TELEC): 4 – Singapore: 4 – Taiwan: 4 • 2.4 GHz Band: <ul style="list-style-type: none"> – 802.11b: ETSI: 13; Israel: 4; Americas: 11; TELEC (Japan): 14 – 802.11g: ETSI: 13; Israel: 4; Americas: 11; Japan (TELEC): 14 CCK, 13 OFDM
Nonoverlapping Channels	<ul style="list-style-type: none"> • Eight (FCC only) • Four (Japan, Singapore, Taiwan) 	<ul style="list-style-type: none"> • Three 	<ul style="list-style-type: none"> • Eleven (FCC only)
Receive Sensitivity	<ul style="list-style-type: none"> • 6 Mbps: -85 dBm • 9 Mbps: -84 dBm • 12 Mbps: -82 dBm • 18 Mbps: -80 dBm • 24 Mbps: -77 dBm • 36 Mbps: -73 dBm • 48 Mbps: -69 dBm • 54 Mbps: -68 dBm 	<ul style="list-style-type: none"> • 802.11b <ul style="list-style-type: none"> – 1 Mbps: -94 dBm – 2 Mbps: -91 dBm – 5.5 Mbps: -89 dBm – 11 Mbps: -85 dBm • 802.11g <ul style="list-style-type: none"> – 1 Mbps: -95 dBm – 2 Mbps: -91 dBm – 5.5 Mbps: -89 dBm – 6 Mbps: -90 dBm – 9 Mbps: -84 dBm – 11 Mbps: -88 dBm – 12 Mbps: -82 dBm – 18 Mbps: -80 dBm – 24 Mbps: -77 dBm – 36 Mbps: -73 dBm – 48 Mbps: -72 dBm – 54 Mbps: -72 dBm 	<ul style="list-style-type: none"> • 802.11a <ul style="list-style-type: none"> – 6 Mbps: -85 dBm – 9 Mbps: -84 dBm – 12 Mbps: -82 dBm – 18 Mbps: -80 dBm – 24 Mbps: -77 dBm – 36 Mbps: -73 dBm – 48 Mbps: -69 dBm – 54 Mbps: -68 dBm • 802.11b <ul style="list-style-type: none"> – 1 Mbps: -94 dBm – 2 Mbps: -91 dBm – 5.5 Mbps: -89 dBm – 11 Mbps: -85 dBm • 802.11g <ul style="list-style-type: none"> – 1 Mbps: -95 dBm – 2 Mbps: -91 dBm – 5.5 Mbps: -89 dBm – 6 Mbps: -90 dBm – 9 Mbps: -84 dBm – 11 Mbps: -88 dBm – 12 Mbps: -82 dBm – 18 Mbps: -80 dBm – 24 Mbps: -77 dBm – 36 Mbps: -73 dBm – 48 Mbps: -72 dBm – 54 Mbps: -72 dBm

Table 2 Product Specifications (Continued)

	With 802.11a Radio Installed	With 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted	With both 802.11a and 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted
Available Transmit Power Settings	<p>802.11a:</p> <ul style="list-style-type: none"> • 40 mW (16 dBm) • 20 mW (13 dBm) • 10 mW (10 dBm) • 5 mW (7 dBm) <p>Maximum power setting will vary according to individual country regulations.</p>	<p>802.11b:</p> <ul style="list-style-type: none"> • 100 mW (20 dBm) • 50 mW (17 dBm) • 30 mW (15 dBm) • 20 mW (13 dBm) • 10 mW (10 dBm) • 5 mW (7 dBm) • 1 mW (0 dBm) <p>Maximum power setting will vary according to individual country regulations.</p> <p>802.11g:</p> <ul style="list-style-type: none"> • 30 mW (15 dBm) • 20 mW (13 dBm) • 10 mW (10 dBm) • 5 mW (7 dBm) • 1 mW (0 dBm) 	<p>802.11a:</p> <ul style="list-style-type: none"> • 40 mW (16 dBm) • 20 mW (13 dBm) • 10 mW (10 dBm) • 5 mW (7 dBm) <p>Maximum power setting will vary according to individual country regulations.</p> <p>802.11g:</p> <ul style="list-style-type: none"> • CCK: <ul style="list-style-type: none"> – 100 mW (20 dBm) – 50 mW (17 dBm) – 30 mW (15 dBm) – 20 mW (13 dBm) – 10 mW (10 dBm) – 5 mW (7 dBm) – 1 mW (0 dBm) <p>Maximum power setting will vary according to individual country regulations.</p> <ul style="list-style-type: none"> • OFDM: <ul style="list-style-type: none"> – 30 mW (15 dBm) – 20 mW (13 dBm) – 10 mW (10 dBm) – 5 mW (7 dBm) – 1 mW (0 dBm)
Range	<p>Indoor: Distance across open office environment</p> <p>802.11a (40 mW with 6dBi gain patch antenna)</p> <ul style="list-style-type: none"> • 45 ft (13 m) @ 54 Mbps • 50 ft (15 m) @ 48 Mbps • 65 ft (19 m) @ 36 Mbps • 85 ft (26 m) @ 24 Mbps • 110 ft (33 m) @ 18 Mbps • 130 ft (39 m) @ 12 Mbps • 150 ft (45 m) @ 9 Mbps • 165 ft (50 m) @ 6 Mbps <p>Outdoor:</p> <p>802.11a (40 mW with 6 dBi gain patch antenna)</p> <ul style="list-style-type: none"> • 100 ft (30m) @ 54 Mbps • 600 ft (183 m) @ 18 Mbps • 1000 ft (304 m) @ 6 Mbps <p>Ranges and actual throughput vary based upon numerous environmental factors so individual performance may differ.</p>	<p>Indoor: Distance across open office environment</p> <p>802.11g (30 mW with 2.2 dBi gain diversity dipole antenna)</p> <ul style="list-style-type: none"> • 90 ft (27 m) @ 54 Mbps • 95 ft (29 m) @ 48 Mbps • 100 ft (30 m) @ 36 Mbps • 140 ft (42 m) @ 24 Mbps • 180 ft (54 m) @ 18 Mbps • 210 ft (64 m) @ 12 Mbps • 250 ft (76 m) @ 9 Mbps • 300 ft (91 m) @ 6 Mbps <p>Outdoor:</p> <p>802.11g (30 mW with 2.2 dBi gain diversity dipole antenna)</p> <ul style="list-style-type: none"> • 250 ft (76m) @ 54 Mbps • 600 ft (183 m) @ 18 Mbps • 1300 ft (396 m) @ 6 Mbps 	<p>Indoor: Distance across open office environment</p> <p>802.11b (100 mW with 2.2 dBi gain diversity dipole antenna)</p> <ul style="list-style-type: none"> • 160 ft (48 m) @ 11 Mbps • 220 ft (67 m) @ 5.5 Mbps • 270 ft (82m) @ 2 Mbps • 410 ft (124 m) @ 1 Mbps <p>Outdoor:</p> <p>802.11b (100 mW with 2.2 dBi gain diversity dipole antenna)</p> <ul style="list-style-type: none"> • 1000 ft (304 m) @ 11 Mbps • 2000 ft (610 m) @ 1 Mbps


Table 2 Product Specifications (Continued)

	With 802.11a Radio Installed	With 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted	With both 802.11a and 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted
Compliance	<p>Standards:</p> <ul style="list-style-type: none"> • Safety: <ul style="list-style-type: none"> – UL 1950 – CSA 22.2 No. 950-95 – IEC 60950 – EN 60950 Radio Approvals: <ul style="list-style-type: none"> – FCC Part 15.401-15.407 – RSS-210 (Canada) – EN 301.893 (Europe) – ARIB STD-T71 (Japan) – AS 4268.2 (Australia) • EMI and Susceptibility (Class B): <ul style="list-style-type: none"> – FCC Part 15.107 and 15.109 – ICES-003 (Canada) – VCCI (Japan) – EN 301.489-1 and -17 (Europe) • Security: <ul style="list-style-type: none"> – 802.1X and TKIP – WPA • Other: <ul style="list-style-type: none"> – IEEE 802.11a – FCC Bulletin OET-65C – RSS-102 	<p>Standards:</p> <ul style="list-style-type: none"> • Safety: <ul style="list-style-type: none"> – UL 1950 – CSA 22.2 No. 950-95 – IEC 60950 – EN 60950 • Radio Approvals: <ul style="list-style-type: none"> – FCC Part 15.247 – RSS-210 (Canada) – EN 300.328 (Europe) – ARIB-STD 33 (Japan) – ARIB-STD 66 (Japan) – AS/NZS 3548 (Australia and New Zealand) • EMI and Susceptibility (Class B): <ul style="list-style-type: none"> – FCC Part 15.107 and 15.109 – ICES-003 (Canada) – VCCI (Japan) – EN 301.489-1 and -17 (Europe) • Security: <ul style="list-style-type: none"> – 802.1X and TKIP – WPA – AES ready (802.11g version) • Other: <ul style="list-style-type: none"> – IEEE 802.11b or IEEE 802.11g – FCC Bulletin OET-65C – RSS-102 	<p>Standards:</p> <ul style="list-style-type: none"> • Safety: <ul style="list-style-type: none"> – UL 1950 – CSA 22.2 No. 950-95 – IEC 60950 – EN 60950 • Radio Approvals: <ul style="list-style-type: none"> – FCC Part 15.401-15.407 – RSS-210 (Canada) – EN 301.893 (Europe) – ARIB STD-T71 (Japan) – AS 4268.2 (Australia) – FCC Part 15.247 – RSS-210 (Canada) – EN 300.328 (Europe) – ARIB-STD 33 (Japan) – ARIB-STD 66 (Japan) – AS/NZS 3548 (Australia and New Zealand) • EMI and Susceptibility (Class B): <ul style="list-style-type: none"> – FCC Part 15.107 and 15.109 – ICES-003 (Canada) – VCCI (Japan) – EN 301.489-1 and -17 (Europe) • Security: <ul style="list-style-type: none"> – 802.1X and TKIP – WPA – AES ready (802.11g version) • Other: <ul style="list-style-type: none"> – IEEE 802.11a – IEEE 802.11g – FCC Bulletin OET-65C – RSS-102
SNMP Compliance	<ul style="list-style-type: none"> • MIB¹ I and MIB II 	<ul style="list-style-type: none"> • MIB I and MIB II 	<ul style="list-style-type: none"> • MIB I and MIB II

Table 2 Product Specifications (Continued)

	With 802.11a Radio Installed	With 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted	With both 802.11a and 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted
Antenna	<ul style="list-style-type: none"> Integrated 6 dBi diversity patch (55 horizontal, 55 vertical beamwidths, 5 dBi diversity omnidirectional with 360 horizontal and 40 vertical beamwidths) 	<p>Two RP-TNC connectors</p> <ul style="list-style-type: none"> 802.11b Approved with the following: AIR-ANT1728; AIR-ANT1729; AIR-ANT1949; AIR-ANT2012; AIR-ANT2506; AIR-ANT3213; AIR-ANT3549; AIR-ANT4941; AIR-ANT5959; AIR-ANT2410Y-R 802.11g Approved with the following: AIR-ANT1728; AIR-ANT1729; AIR-ANT2012; AIR-ANT2506; AIR-ANT3213; AIR-ANT3549; AIR-ANT4941; AIR-ANT5959; AIR-ANT2410Y-R 	<p>5 GHz:</p> <ul style="list-style-type: none"> Integrated 6 dBi diversity patch (55 horizontal, 55 vertical beamwidths, 5 dBi diversity omnidirectional with 360 horizontal and 40 vertical beamwidths) <p>2.4 GHz:</p> <ul style="list-style-type: none"> Two RP-TNC connectors 802.11b Approved with the following: AIR-ANT1728; AIR-ANT1729; AIR-ANT1949; AIR-ANT2012; AIR-ANT2506; AIR-ANT3213; AIR-ANT3549; AIR-ANT4941; AIR-ANT5959; AIR-ANT2410Y-R 802.11g Approved with the following: AIR-ANT1728; AIR-ANT1729; AIR-ANT2012; AIR-ANT2506; AIR-ANT3213; AIR-ANT3549; AIR-ANT4941; AIR-ANT5959; AIR-ANT2410Y-R
Security Architecture Client Authentication	<p>Cisco Wireless Security Suite including:</p> <ul style="list-style-type: none"> Authentication: <ul style="list-style-type: none"> 802.1X support including LEAP, PEAP, EAP-TLS, EAP-TTLS, and EAP-SIM to yield mutual authentication and dynamic, per-user, per-session encryption keys MAC address and by standard 802.11 authentication mechanisms Encryption: <ul style="list-style-type: none"> Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits TKIP encryption enhancements: key hashing (per-packet keying), message integrity check (MIC) and broadcast key rotation via WPA TKIP or Cisco TKIP 	<p>Cisco Wireless Security Suite including:</p> <ul style="list-style-type: none"> Authentication: <ul style="list-style-type: none"> 802.1X support including LEAP, PEAP, EAP-TLS, EAP-TTLS, and EAP-SIM to yield mutual authentication and dynamic, per-user, per-session encryption keys MAC address and by standard 802.11 authentication mechanisms Encryption: <ul style="list-style-type: none"> Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits TKIP encryption enhancements: key hashing (per-packet keying), message integrity check (MIC) and broadcast key rotation via WPA TKIP or Cisco TKIP AES ready with full support in 2004 (802.11g version) 	<p>Cisco Wireless Security Suite including:</p> <ul style="list-style-type: none"> Authentication: <ul style="list-style-type: none"> 802.1X support including LEAP, PEAP, EAP-TLS, EAP-TTLS, and EAP-SIM to yield mutual authentication and dynamic, per-user, per-session encryption keys MAC address and by standard 802.11 authentication mechanisms Encryption: <ul style="list-style-type: none"> Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits TKIP encryption enhancements: key hashing (per-packet keying), message integrity check (MIC) and broadcast key rotation via WPA TKIP or Cisco TKIP AES ready with full support in 2004 (802.11g version)

Table 2 Product Specifications (Continued)

	With 802.11a Radio Installed	With 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted	With both 802.11a and 802.11g Radio Installed NOTE: 802.11g specifications in this column also apply to the 802.11b radio, unless otherwise noted
Status LEDs	<ul style="list-style-type: none"> Three indicators on the top panel report association status, operation, error/warning, firmware upgrade, and configuration, network/modem, and radio status. 	<ul style="list-style-type: none"> Three indicators on the top panel report association status, operation, error/warning, firmware upgrade, and configuration, network/modem, and radio status. 	<ul style="list-style-type: none"> Three indicators on the top panel report association status, operation, error/warning, firmware upgrade, and configuration, network/modem, and radio status.
Software Image Network and Inventory Support	<ul style="list-style-type: none"> CiscoWorks RME², CiscoWorks SWIM³ 	<ul style="list-style-type: none"> CiscoWorks RME, CiscoWorks SWIM 	<ul style="list-style-type: none"> CiscoWorks RME, CiscoWorks SWIM
Remote Configuration Support	<ul style="list-style-type: none"> BOOTP, DHCP⁴, Telnet, HTTP, FTP, ⁵ TFTP,⁶ and SNMP 	<ul style="list-style-type: none"> BOOTP, DHCP, Telnet, HTTP, FTP, TFTP, and SNMP 	<ul style="list-style-type: none"> BOOTP, DHCP, Telnet, HTTP, FTP, TFTP, and SNMP
Local Configuration	<ul style="list-style-type: none"> Direct console port (RJ-45 interface) 	<ul style="list-style-type: none"> Direct console port (RJ-45 interface) 	<ul style="list-style-type: none"> Direct console port (RJ-45 interface)
Dimensions	<ul style="list-style-type: none"> 6.562 in. (16.67 cm) wide; 7.232 in. (18.37 cm) deep; 1.660 in. (4.22 cm) high Mounting bracket adds 0.517 in. (1.31 cm) to the height 	<ul style="list-style-type: none"> 6.562 in. (16.67 cm) wide; 7.232 in. (18.37 cm) deep; 1.660 in. (4.22 cm) high Mounting bracket adds 0.517 in. (1.31 cm) to the height 	<ul style="list-style-type: none"> 6.562 in. (16.67 cm) wide; 7.232 in. (18.37 cm) deep; 1.660 in. (4.22 cm) high Mounting bracket adds 0.517 in. (1.31 cm) to the height
Weight	<ul style="list-style-type: none"> 26 oz (737g) add 6.4 oz (181g) for mounting bracket 	<ul style="list-style-type: none"> 25.6 oz (724g) add 6.4 oz (181g) for mounting bracket 	<ul style="list-style-type: none"> 27.6 oz (783g) add 6.4 oz (181g) for mounting bracket
Environmental	<ul style="list-style-type: none"> -4–122 F (-20–50 C), 0–90% humidity (noncondensing) 	<ul style="list-style-type: none"> -4–131 F (-20–55 C), 0–90% humidity (noncondensing) 	<ul style="list-style-type: none"> -4–122 F (-20–50 C), 0–90% humidity (noncondensing)
Processor	<ul style="list-style-type: none"> IBM PowerPC405 200 MHz 	<ul style="list-style-type: none"> IBM PowerPC405 200 MHz 	<ul style="list-style-type: none"> IBM PowerPC405 200 MHz
System Memory	<ul style="list-style-type: none"> 16 Mbytes RAM 8 Mbytes FLASH 	<ul style="list-style-type: none"> 16 Mbytes RAM 8 Mbytes FLASH 	<ul style="list-style-type: none"> 16 Mbytes RAM 8 Mbytes FLASH
Input Power Requirements	<ul style="list-style-type: none"> 90 to 240 VAC 0% (power supply) 48 VDC 0% 	<ul style="list-style-type: none"> 90 to 240 VAC 0% (power supply) 48 VDC 0% 	<ul style="list-style-type: none"> 90 to 240 VAC 0% (power supply) 48 VDC 0%
Power Draw	<ul style="list-style-type: none"> 8 watts, RMS 	<ul style="list-style-type: none"> 6 watts, RMS 	<ul style="list-style-type: none"> 11 watts, RMS
Warranty	<ul style="list-style-type: none"> One year 	<ul style="list-style-type: none"> One year 	<ul style="list-style-type: none"> One year
Wi-Fi Certification			

1. Management Information Base
2. CiscoWorks Resource Manager Essentials
3. Software Image Manager
4. Dynamic Host Configuration Protocol
5. File Transfer Protocol
6. Trivial File Transfer Protocol

Table 3 Product System Requirements

Feature	System Requirement
Standard 802.1X-Compliant User-level Authentication and Dynamic Encryption Keying	One of the following RADIUS servers: <ul style="list-style-type: none"> • Cisco Secure Access Control Server Version 3.0 or greater • Cisco Access Registrar Version 3.0 or greater • Funk Software Steel-Belted RADIUS Server Version 3.0 or greater • Interlink Networks RAD-Series RADIUS Server Version 5.1 or greater
CiscoWorks RME/SWIM	<ul style="list-style-type: none"> • CiscoWorks LAN Management System (LMS) or Routed WAN Management Solution (RWAN)
Line Power over Ethernet Support (2.4 GHz radio only)	<ul style="list-style-type: none"> • Cisco AIR-PWRINJ3= Aironet 1100 and 1200 Series Power Injector • Cisco AIR-PWRINJ-FIB= Aironet Power Injector Media Converter • Cisco Catalyst 3550-24 PWR Switch • Cisco Catalyst 4500 and 6500 Series switches with inline power • Cisco WS-PWR-PANEL Midspan Power Patch Panel
Line Power over Ethernet Support (both 5 GHz and 2.4 GHz radio)	<ul style="list-style-type: none"> • Cisco AIR-PWRINJ3= Aironet 1100 and 1200 Series Power Injector • Cisco AIR-PWRINJ-FIB= Aironet Power Injector Media Converter • Cisco Catalyst 3550-24 PWR Switch
Line Power over Ethernet Support (5 GHz radio only)	<ul style="list-style-type: none"> • Cisco AIR-PWRINJ3= Aironet 1100 and 1200 Series Power Injector • Cisco AIR-PWRINJ-FIB= Aironet Power Injector Media Converter • Cisco Catalyst 3550-24 PWR Switch

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