

# Cisco Aironet 350 Series Access Points

The Cisco Aironet 350 Series Standard and Rugged Access Points



The Cisco Aironet® 350 Series Access Point (AP) delivers a cost-effective, reliable, secure, and easily managed wireless LAN (WLAN) solution for enterprise, small- and medium-sized businesses (see Figure 1). The Cisco Aironet 350 Series leads the industry in performance, range, reliability, security and mobility. It is easy to deploy and manage and reduces overall cost of ownership.

The Cisco Aironet 350 Series AP supports data rates of up to 11 Mbps, is IEEE 802.11b compliant, and offers key features that meet all enterprise requirements:

- Support for inline power over Ethernet, simplifying and reducing the total cost of installation and ownership
- High-performance 100-milliwatt (mW) radio design with power management capabilities, delivering industry-leading throughput, range, and reliability

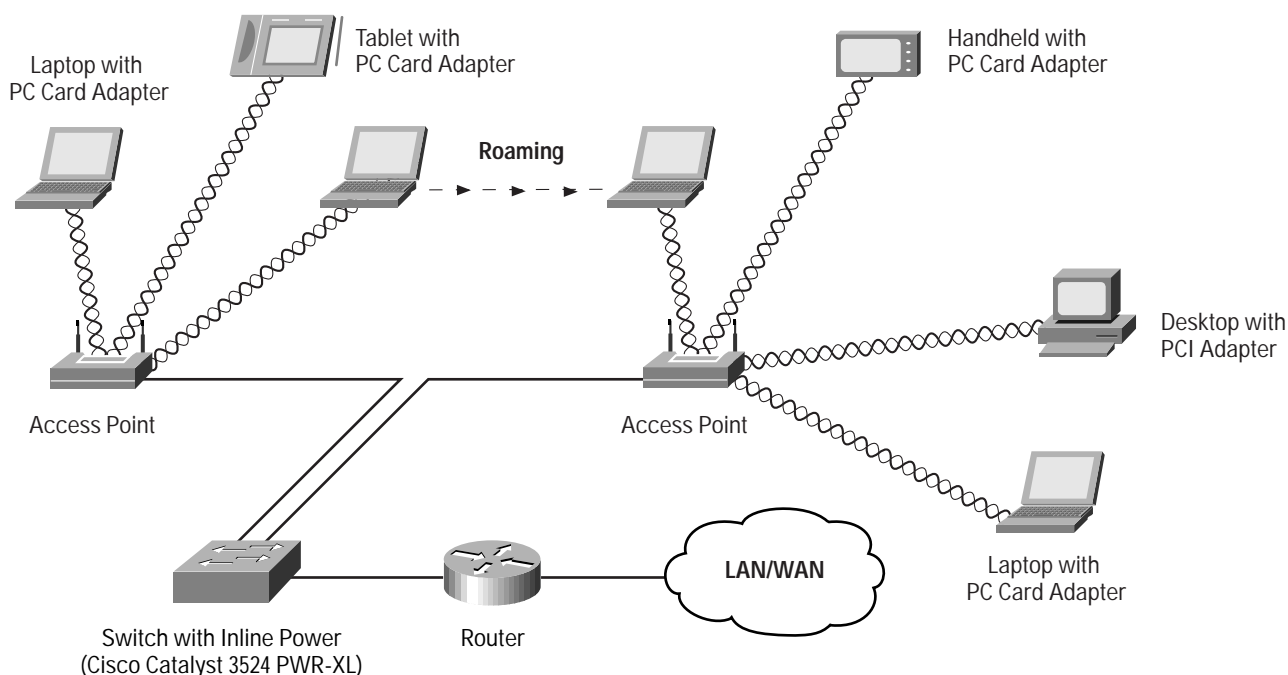
- Architecture that protects user investments by supporting future software features
- Available in two versions: standard and rugged. The standard AP has a plastic case, standard operating temperature, and integrated antennas. The rugged AP has an extended operating temperature range, external antenna connectors for auxiliary antennas, and a metal case for durability and plenum rating.

The Cisco Aironet 350 Series supports the following software features:

- IEEE 802.1x-based Extensible Authentication Protocol (EAP) services that provide centralized, user-based authentication and single-user, single-session encryption keys for hassle-free security administration and user-based privacy
- Automatic channel selection, Cisco Discovery Protocol (CDP), Dynamic Host Configuration Protocol (DHCP), and BOOTP services to simplify installation and management of WLANs
- High-availability services, such as load balancing and hot-standby redundancy, for dependable performance
- Rich filtering options on both the Ethernet and radio side to provide performance and application tuning to meet specific business requirements



Figure 1 An AP is the center point in an all-wireless network or serves as a connection point between a wired and wireless network. Multiple APs can be placed throughout a facility to give users with WLAN adapters the ability to roam freely throughout an extended area while maintaining uninterrupted access to all network resources.



### A Rugged Design to Increase Deployment Options

The Cisco Aironet 350 Series AP is available in a rugged version (AIR-AP352E2R-x-K9). This enhanced version includes two RP-TNC connectors for use with optional antennas, an extended operating temperature range of -20 to 55 C, allowing for placement outdoors in a NEMA case or in harsh indoor environments such as warehouses and factories, and a durable metal enclosure. With its metal enclosure, the Cisco Aironet 350 Series AP is UL 2043 certified, and designed to achieve plenum rating as defined by various municipal fire codes. The Cisco Aironet 350 Series AP is also available in a standard version (AIR-AP352E2C) with a plastic enclosure and two captured, nonremovable 2.2 dBi diversity dipole antennas.

### Simplified Deployment and Reduced Total Cost of Installation and Ownership

The Cisco Aironet 350 Series AP includes a 10/100 Ethernet uplink for seamless integration with existing wired LANs. To minimize installation costs, the Cisco Aironet 350 Series AP draws operating power from a powered Ethernet port. This line power configuration works with all Cisco line power-enabled devices such as Catalyst switches and line power patch panels (see Figures 2-4) A line power injector, included with the product, can also be used to power the Cisco Aironet 350 Series AP.



Figure 2 The AP can utilize a Cisco Catalyst 3524-PWR-XL for its power

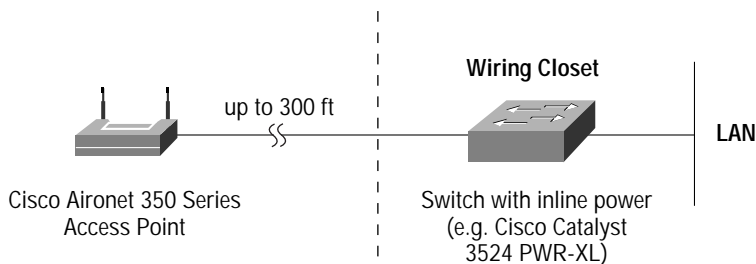


Figure 3 A Cisco Catalyst Inline Power Patch Panel may be used to power the AP

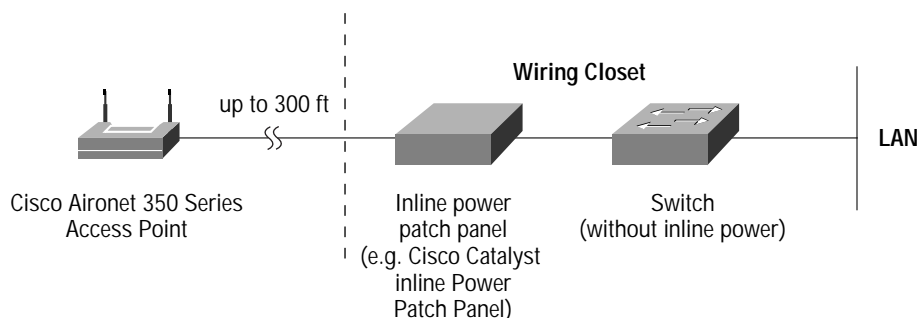
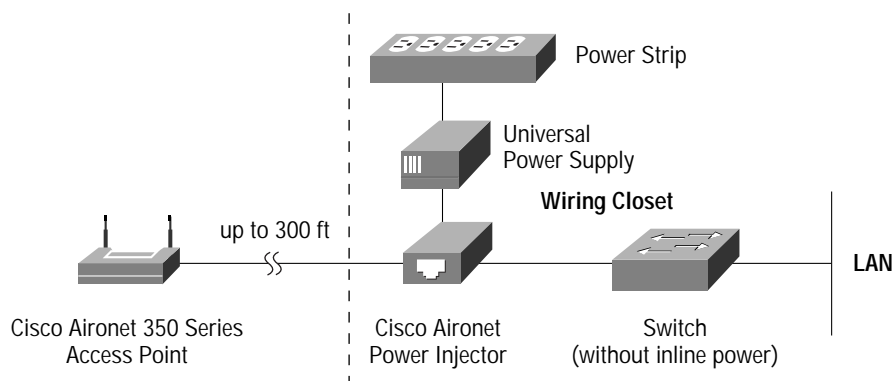


Figure 4 Cisco also offers a power injector to power the Cisco Aironet 350 Series AP



### Industry-Leading WLAN Performance, Range, and Reliability

The 100-mW transmit power and receive sensitivity of the Cisco Aironet 350 Series AP leads the industry in range and reliability. Antenna diversity and superior delay spread (multipath) characteristics of the Cisco Aironet 350 Series deliver improved performance even in harsh environments such as warehouses, factories, and metal buildings.

Administrators can configure the radio transmit power (1, 5, 20, 30, 50, and 100 mW) on the Cisco Aironet 350 Series to meet specific coverage requirements and minimize interference. In addition to an AP with two captured 2.2 dBi antennas, an AP with two RP-TNC connectors is offered for more challenging applications, where a broad portfolio of removable antennas can be used to further increase range and reliability.

### Investment Protection

To protect the users' investment, all Cisco Aironet 350 Series APs and bridges feature sufficient Flash memory to handle future firmware upgrades.



## WLAN Software Services Needed for Business-Class Applications

Centralized Security Architecture with Dynamic Session Key Management  
Security is a primary concern for all WLAN installations. First-generation wireless security schemes based on service set identifier (SSID) and manual wired equivalent privacy (WEP) key management imposed significant administrative burdens upon the user. This burden precluded large-scale deployments. The Cisco solution leads the industry in providing scalable, standards-based, centralized security management that delivers dynamic single-session, single-user encryption keys integrated with the network logon.

The Cisco security architecture is based on the IEEE 802.1x standard for wireless networks. It is an extensible security framework that accommodates a variety of authentication and key management methods (see Figure 5). Cisco Aironet APs work with EAP-enabled Remote Access Dial-In User Service (RADIUS) servers such as the Cisco Access Control Server 2000 Version 2.6 and EAP-enabled client adapters such as Cisco Aironet Series clients to provide user-level authentication over an encrypted link. After successful mutual authentication with the RADIUS server, the user derives a dynamic WEP encryption key that uniquely encrypts that user's traffic over the air, ensuring security from both outside sources and inside network users. The access control server (ACS)

RADIUS server uses lightweight directory access protocol (LDAP) or open database connectivity services (ODBC) to take advantage of the enterprise identity server database, allowing IT managers to instantly enable wireless security to all users.

Integrated Management for Configuration, Monitoring, and Troubleshooting  
The Cisco Aironet Series offers simplified installation and configuration, for rapid, anytime, anywhere installation, configuration, and management (see Figure 6). The series supports Web-based management and Simple Network Management Protocol (SNMP) features to aid monitoring, troubleshooting, software download, and event logging.

The frequency agility option of the Cisco Aironet Series takes the guesswork out of channel configuration. In this mode, the AP automatically scans the area and selects the least-congested channel. The installer does not need to be aware of the settings of other Cisco APs in the coverage area. For enterprise management, the Cisco Aironet Series provides support for Cisco Discovery Protocol (CDP) to enable auto discovery of Cisco Aironet APs and bridges using Cisco enterprise management applications such as CiscoWorks2000. Additionally, Cisco Aironet APs support standard SNMP Management Information Base (MIB) II, Cisco Aironet Series private MIB, and 802.11b MIB. Cisco Aironet Series APs can also be managed via the console or the Telnet interface.

Figure 5 The 802.1x architecture implemented by Cisco is the first enterprise-ready security system for WLANs

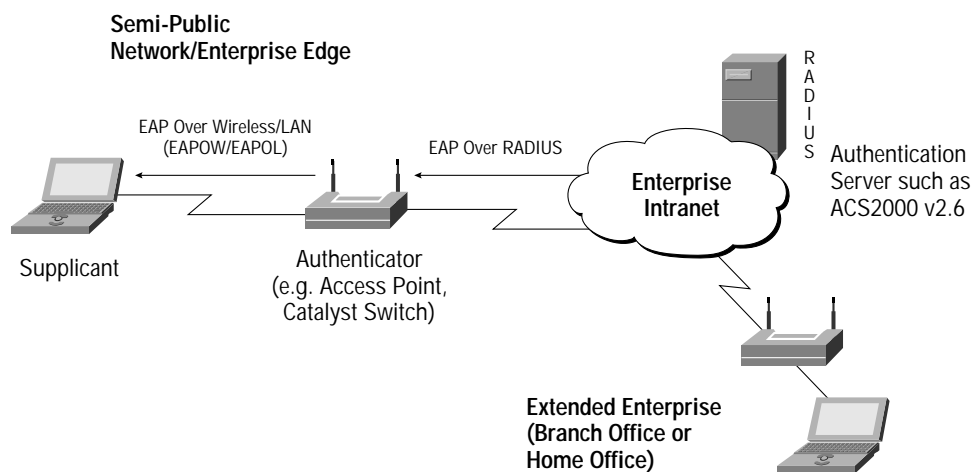




Figure 6 The Access Point Management System's Express Setup screen provides all the settings required for basic configuration of the access point.

[Home](#) [Map](#) [Help](#) Uptime: 04:07:23

System Name:	<input type="text" value="Cisco AP350"/>
MAC Address:	00:40:96:25:85:4d
Configuration Server Protocol:	<input type="text" value="DHCP"/>
Default IP Address:	<input type="text" value="10.0.0.1"/>
Default IP Subnet Mask:	<input type="text" value="255.255.255.0"/>
Default Gateway:	<input type="text" value="10.0.0.1"/>
Radio Service Set ID (SSID):	<input type="text" value="tsunami"/>
Role in Radio Network:	<input type="text" value="Access Point/Root"/>
Optimize Radio Network For:	<input checked="" type="radio"/> Throughput <input type="radio"/> Range <input type="radio"/> Custom
Ensure Compatibility With:	<input type="checkbox"/> 2Mb/sec Clients <input type="checkbox"/> non-Aironet 802.11
SNMP Admin. Community:	<input type="text" value="admin"/>

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### Industry-Leading WLAN Performance and Scalability

All Cisco Aironet Series APs feature load-balancing services. Up to three APs, configured for different channels, can be colocated to achieve aggregate peak capacity of 33 Mbps for a single coverage area.

Load-balancing policies based on number of users, error rates, and signal strengths redistribute users to deliver more balanced collision domains—improving overall performance for installations covering a large number of users.

Broadcast and multicast filtering also enhance scalability. Filtering allows administrators to select the amount of such frames that enter the WLAN, conserving the shared bandwidth. Layer 3 IP Net and IP Socket filters are also provided.

### Reliability and High-Availability that Enterprise Installations Count On

For business-critical deployments, a Cisco Aironet AP can be configured as a redundant hot standby to another AP in the same coverage area. The hot-standby AP continually monitors the primary AP on the same channel, and assumes its role in the rare case of a failure of the primary AP.

### Comprehensive WLAN Solution

Cisco offers a comprehensive WLAN solution including APs and bridges, a variety of client adapters supporting all popular operating systems, a broad selection of antennas, as well as a security server and enterprise management applications.

Because it is a part of the Cisco Aironet Series, the Cisco Aironet 350 AP delivers the high level of security, manageability, scalability, and cost-effectiveness needed to deliver ubiquitous enterprise wireless services that extend user mobility and enhance overall productivity. Table 1 provides specifications on the Cisco Aironet 350 Series AP.



Table 1 Cisco Aironet 350 Series Specifications

Part Numbers	AIR-AP352E2C, the standard AP AIR-AP352E2R-A-K9, the rugged AP configured for operation in most of the Americas AIR-AP352E2R-E-K9, the rugged AP configured for operation in most of Europe and Singapore AIR-AP352E2R-J-K9, the rugged AP configured for operation in Japan For more details on country specific ordering information see the following link: <a href="http://www.cisco.com/go/aironet/compliance">www.cisco.com/go/aironet/compliance</a>
Data Rates Supported	1, 2, 5.5, and 11 Mbps
Network Standard	IEEE 802.11b
Uplink	Auto-sensing 10/100BaseT Ethernet
Frequency Band	2.4 to 2.497 GHz
Network Architecture Types	Infrastructure
Wireless Medium	Direct Sequence Spread Spectrum (DSSS)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation	DBPSK @1 Mbps; DQPSK @ 2 Mbps; CCK @ 5.5 and 11 Mbps
Operating Channels	North America: 11; ETSI: 13; Japan: 14
Non-overlapping Channels	Three
Receive Sensitivity	1 Mbps: -94 dBm 2 Mbps: -91 dBm 5.5 Mbps: -89 dBm 11 Mbps: -85 dBm
Delay Spread	1 Mbps: 500 ns 2 Mbps: 400 ns 5.5 Mbps: 300 ns 11 Mbps: 140 ns
Available Transmit Power Settings	100 mW (20 dBm) 50 mW (17 dBm) 30 mW (15 dBm) 20 mW (13 dBm) 5 mW (7 dBm) 1 mW (0 dBm) Maximum power setting will vary according to individual country regulations.
Range (typical @ 100-mW transmit power setting with 2.2 dBi diversity dipole antenna)	Indoor: 130 ft (39.6 m) @ 11 Mbps 350 ft (107 m) @ 1 Mbps Outdoor: 800 ft (244 m) @ 11 Mbps 2000 ft (610 m) @ 1 Mbps
Compliance	Operates license free under FCC Part 15 and complies as a Class B device; complies with DOC regulations; complies with ETS 300.328, FTZ 2100, and MPT 1349 standards; rugged version complies with UL 2043
SNMP Compliance	MIB I and MIB II

Table 1 Cisco Aironet 350 Series Specifications (Continued)

Antenna	AIR-AP352E2C: Two nonremovable 2.2-dBi diversity dipoles AIR-AP352E2R-x-K9: Two RP-TNC connectors (antennas optional, none supplied with unit)
Encryption Key Length	128-bit
Security	IEEE 802.1x (proposal includes EAP and RADIUS) and IEEE 802.11 WEP (Wired Equivalent Privacy)
Status Indicators	Three indicators on the top panel provide information concerning association status, operation, error/warning, firmware upgrade, and configuration, network/modem, and radio status
Automatic Configuration Support	BOOTP and DHCP
Remote Configuration Support	Telnet, HTTP, FTP, TFTP, and SNMP
Local Configuration	Direct console port (with supplied serial cable)
Dimensions	6.30 in. (16 cm) wide x 4.72 in. (12 cm) deep x 1.45 in. (3.7 cm) high
Weight	Standard version: 12.3 oz (350g) Rugged version: 1.43 lbs (.648 kg)
Plenum Rated Enclosure	Metal case available with AIR-AP352E2R-x-K9
Environmental	AIR-AP352E2C: Temperature: 32° to 122° F (0° to 50° C) 10 to 90% (noncondensing) AIR-AP352E2R-x-K9 Temperature: -4° to 131°F (-20° to 55° C) 10 to 90% (noncondensing)
Input Power Requirements	24VDC +/- 10% to 60 VDC (Ethernet line power)
Warranty	One year



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