

The Cisco Wireless LAN Controller Modules

Q. What are the Cisco® Wireless LAN Controller Modules?

A. Cisco Wireless LAN Controller Modules are modules that are supported on the Cisco 2800, 2900, 3800 and 3900 Series Integrated Services Routers and Cisco 3700 Series routers. The Cisco Wireless LAN Controller Modules (WLCM) work in conjunction with Cisco Aironet® Access Points and the Cisco Wireless Control System (WCS) to provide systemwide wireless LAN functions. As a component of the Cisco Unified Wireless Network, the WLCM gives network administrators the visibility and control necessary to effectively and securely manage business-class WLANs and mobility services, such as enhanced security, voice, guest access, and context-aware mobility or location services. The Cisco Wireless LAN Controller Modules manage up to 6, 12, or 25 Cisco Aironet Access Points.

Q. Who is the ideal customer for the WLCM?

A. The Cisco Wireless LAN Controller Modules allow small and medium-sized businesses (SMBs) and enterprise branch offices to cost-effectively deploy and manage secure wireless LANs. With the Cisco Wireless LAN Controller Modules, SMBs and enterprise branch offices can cost-effectively support their network requirements with converged networks that integrate data, voice, video, and wireless.

Q. What are the SKUs for Cisco Wireless LAN Controller Modules?

A. The SKUs for the Cisco Wireless LAN Controller Modules are listed in Table 1.

Table 1. Part Numbers for Cisco Wireless LAN Controller Modules

Part Number	Product Name
NME-AIR-WLC6-K9	Cisco Wireless LAN Controller Module for managing up to 6 access points (when sold as part of ISR system)
NME-AIR-WLC6-K9=	Cisco Wireless LAN Controller Module for up to 6 access points (spare, ordered as an individual unit)
NME-AIR-WLC12-K9	Cisco Wireless LAN Controller Module for managing up to 12 access points (when sold as part of ISR system)
NME-AIR-WLC12-K9=	Cisco Wireless LAN Controller Module for up to 12 access points (spare, ordered as an individual unit)
NME-AIR-WLC25-K9	Cisco Wireless LAN Controller Module for managing up to 25 access points (when sold as part of ISR system)
NME-AIR-WLC25-K9=	Cisco Wireless LAN Controller Module for up to 25 access points (spare, ordered as an individual unit)
SM-NM-ADPTR	Network Module Adapter for SM Slot on Cisco 2900 and 3900 Series ISR
SM-NM-ADPTR=	Network Module Adapter for SM Slot on Cisco 2900 and 3900 Series ISR (spare)

Q. Which Integrated Services Router models are supported?

A. The Cisco Wireless LAN Controller modules support Cisco 2800, 2900, 3800 and 3900 Series Integrated Services Routers, as well as Cisco 3700 Series routers. Cisco 2600 Series and 2600XM Series routers are not supported, nor are Cisco 2801 routers, which do not have network module slots.

Note: Support for the Cisco Wireless LAN Controller modules in the 2911, 2921, 2951, 3925, and 3945 will be via the network module adapter card (SM-NM-ADPTR).

Q. What are the benefits offered by a Cisco Wireless LAN Controller Module?

A. By managing all access points as a complete wireless LAN system, Cisco WLCMs provide maximum scalability, performance, and wireless LAN control. Cisco wireless LAN controllers come equipped with embedded software that uses radio resource management (RRM) algorithms to detect and adapt to changes in the air space in real time, creating a self-configuring, self-optimizing, and self-correcting wireless LAN environment. These adjustments create the optimal topology for wireless networking in much the same way that routing protocols compute the best possible topology for IP networks.

Q. Are the Cisco Wireless LAN Controller Modules functionally similar to any other Cisco wireless LAN controllers?

A. All Cisco Wireless LAN Controllers support the same software functionality. The differences between the models are related to interfaces and capacity. From an overall (hardware and software) perspective, the WLCM is most similar to the Cisco 2100 Series Wireless LAN Controller.

- An Integrated Services Router with a Cisco Wireless LAN Controller Module and Cisco EtherSwitch[®] Module can connect 6, 12 or 25 Lightweight Access Point Protocol (LWAPP)-enabled Cisco Aironet access points without a separate switch, while maintaining feature parity with the Cisco 2100 Series stand-alone Controllers. Cisco Aironet access points can be connected to an Ethernet switch module on the Integrated Services Router (for example, 4-port, 9-port, 16-port, 24-port, and 48-port modules with Power over Ethernet [PoE]).
- An Integrated Services Router with a Cisco Wireless LAN Controller Module can provide local authentication for clients using Cisco LEAP, without requiring a separate authentication, authorization, and accounting (AAA) server. Up to 1000 clients can be supported by an Integrated Services Router (the Cisco 2811, 2911, 2821 and 2921 routers supports 100 clients; the 2851 and 2951 supports 200; the 3825 and 3925 supports 500; the 3725 supports 250; the 3745 supports 500; and the 3845 and 3945 supports 1000). The local authentication server can also serve as a survivable backup for a central site AAA server.
- A command-line interface (CLI) wizard is required for the initial configuration setup.

Q. Do the Wireless LAN Controller Modules support 802.11n?

A. Yes. The Cisco Wireless LAN Controller Modules deliver support for IEEE 802.11n draft 2.0 standard through Cisco Next-Generation Wireless solutions. This solution achieves data rates of up to 300 Mbps per radio to support more users and devices, as well as mission-critical and bandwidth-intensive applications.

Q. What are the challenges of extending enterprise-class wireless access to branch offices?

A. The main challenge is the ability to deploy, manage, and secure wireless networks with limited IT staff across hundreds of remote sites. The Cisco Wireless LAN Controller Modules, along with LWAPP-enabled Cisco Aironet access points, addresses the deployment and operational challenges of enterprise wireless networking at remote sites by eliminating the need to configure and manage each individual access point. In addition, the Cisco WCS can be used to manage hundreds of remote sites with Cisco Wireless LAN Controller Modules.

Q. Are the Cisco Wireless LAN Controller Modules part of the Cisco Unified Wireless Network?

A. Yes. All Cisco wireless LAN controllers, including the Cisco Wireless LAN Controller Modules, are an integral part of the Cisco Unified Wireless Network. For complete details on the Cisco Unified Wireless Network, visit <http://www.cisco.com/go/unifiedwireless>.

Features and Benefits

Q. What are the features and benefits of the Cisco Wireless LAN Controller Modules?

A. Feature Benefits

- Integration with Cisco Routers—Cisco Wireless LAN Controller Modules are supported on the Cisco 2800, 2900, 3800 and 3900 Series Integrated Services Routers and Cisco 3700 Series routers.
 - With the Cisco Wireless LAN Controller Modules, SMBs and enterprise branch offices can cost-effectively support their network requirements with converged networks that integrate data, voice, video, and wireless.
 - Integrated branch-office platforms lower hardware costs, simplify remote management, and offer flexible configuration options that reduce the total cost of operations and ownership.
 - By using the existing rich portfolio of services such as integrated Cisco EtherSwitch modules with PoE, IP communications, and security, the Wireless LAN Controller Modules deliver a more economical and manageable solution for customers.
- Zero-touch configuration
 - The Cisco Wireless LAN Controller Modules eliminate the need to individually configure, manage, and monitor each access point.
 - The Cisco Wireless LAN Controller Modules enable zero-touch LWAPP-enabled access point configuration and are ideal for environments with limited onsite IT support, such as branch offices within a distributed enterprise. By managing all access points as a complete wireless LAN system, the Cisco Wireless LAN Controller Modules provide complete wireless LAN control and maximize wireless LAN performance.
- Centralized management across many branches
 - A single Cisco WCS can manage 100 wireless LAN controller modules located across several remote sites. The Cisco Wireless LAN Controller Modules can also be managed without a Cisco WCS, using a command-line interface or an intuitive web interface.
- RF security
 - Integrated wireless intrusion prevention preserves the integrity of wireless networks and sensitive corporate information.
- Integrated radio resource management (RRM)
 - A Cisco Wireless LAN Controller Module creates an intelligent RF control plane for self-configuration, self-healing, and self-optimization.
- Fast secure mobility
 - Fast secure roaming between access points enables low-latency applications such as voice over WLAN (branchwide cordless telephony).

Q. Do the Cisco Wireless LAN Controller Modules support Cisco Aironet access points?

A. All LWAPP-enabled Cisco Aironet access points are supported, including the Integrated APs on the Cisco 880 and 890 Series ISRs and Cisco Aironet 1100 and 1200 Series stand-alone APs. The Cisco HWIC-AP interface cards are not supported.

Q. Is direct connect mode supported?

A. Organizations can connect 6, 12, or 25 access points directly to Cisco EtherSwitch modules on Integrated Services Routers. However, the Wireless LAN Controller Modules do not support direct connect mode—the access points are not directly connected to the WLCM module itself.

Q. How many Cisco Wireless LAN Controller Modules are supported per Integrated Services Router?

A. One. Two Wireless LAN Controller Modules in one router are not supported.

Q. Does the Cisco Wireless LAN Controller Module have a Fast Ethernet service port?

A. No. Cisco Wireless LAN Controller Modules do not have a Fast Ethernet service port.

Q. Do physical interfaces connect the Cisco Wireless LAN Controller Modules to the infrastructure?

A. No. There are no physical interfaces on the faceplate of the Cisco Wireless LAN Controller Modules to connect to the infrastructure. The Cisco Wireless LAN Controller modules require ingress and egress interfaces from the Integrated Services Router to provide connectivity to the network. (Note: The Fast Ethernet port on the Wireless LAN Controller Module faceplate is not supported.)

Q. Is Hybrid Remote Edge Access Point (H-REAP) supported?

A. Yes.

Q. Is online insertion and removal (OIR) supported?

A. OIR is supported on Cisco 3745, 3845, 3925, and 3945 platforms.

Q. Is a Network Time Protocol (NTP) server required?

A. To resolve loss of time upon router reset, an NTP server is required on the network.

Mobility**Q. Is fast secure mobility between access points supported?**

A. Yes. Cisco enables Layer 3 mobility through the use of mobility groups. A mobility group defines the infrastructure resources and their connectivity to each other. When a wireless client associates and authenticates to an access point, the WLCM tracks each client in its client database. The WLCM tracks the client's MAC and IP addresses, security context and associations, quality of service (QoS) contexts, WLAN IDs, and associated access point.

When the wireless client moves its association from one access point to another, the WLCM updates the client database with the newly associated access point. If necessary, new security context and associations are established using Cisco's Centralized Key Management Protocol (CCKM). CCKM helps ensure that time-sensitive applications, such as VoIP, can be fully mobile and secure with minimal roaming latency. With Lightweight Access Point Protocol (LWAPP)-enabled Cisco Aironet access points configured with a WLCM, it is possible for a client to roam from an access point attached to one controller to an access point attached to a second controller without disruption to the session.

Q. Is inter-controller mobility supported by the Cisco Wireless LAN Controller Modules?

A. Yes. The WLCM supports mobility groups and the mobility messaging exchange protocol that helps enable seamless roaming across physically separate controllers in the same mobility group.

Q. How many simultaneous wireless clients can be supported by the Cisco Wireless LAN Controller Modules?

A. 256 simultaneous wireless clients are supported on the 6 access point module. 350 simultaneous wireless clients are supported on the 12 and 25 access point modules.

Q. What fast secure roaming protocols are supported on the Cisco Wireless LAN Controller Modules?

A. The WLCM supports Cisco Centralized Key Management Protocol (CCKM). CCKM helps ensure that time-sensitive applications, such as VoIP, can be fully mobile and secure with minimal roaming latency when a client roams to a new access point.

Q. Do the Cisco Wireless LAN Controller Modules support the Cisco Unified Wireless IP Phone 7921G?

A. Yes. Cisco Unified Wireless IP Phone 7920, Cisco Unified Wireless IP Phone 7921G, and Spectralink handsets are supported.

Q. Is guest access supported?

A. Yes. Secure guest access is supported; however, the Cisco Wireless LAN Controller Module should not be used as a guest anchor controller.

Q. Is Ethernet over IP (EoIP) tunneling for guest traffic supported?

A. Guest tunnels can be initiated from the WLCM to the guest anchor controller but cannot be terminated. For termination of guest EoIP tunnels, a Cisco 4400 Series Wireless LAN Controller or Cisco Catalyst® 6500 Series Wireless Services Module (WiSM) is required.

Security**Q. What security features does the Cisco Wireless LAN Controller Module provide?**

A. The Cisco Wireless LAN Controller Modules provide multiple layers of wireless LAN security for complete enterprise protection, including support for industry standards such as:

- 802.11i, Wi-Fi Protected Access (WPA), WPA2, and Wired Equivalent Privacy (WEP)
- 802.1X using multiple Extensible Authentication Protocol (EAP) types, including Protected EAP (PEAP), EAP-Transport Layer Security (EAPTLS), EAP-Tunneled TLS (EAP-TTLS), and Cisco LEAP
- Rogue access point detection and containment
- Wireless IPS
- Wired and Wireless IDS
- Consistent security policy enforcement across an entire wireless network
- Cisco Network Admission Control (NAC)

Q. Is control traffic from the Cisco Wireless LAN Controller Module encrypted with AES?

A. Yes. All control traffic is encrypted using the Advanced Encryption Standard (AES) between the controller module and access points.

Q. Does the Cisco Wireless LAN Controller Module support peer-to-peer blocking?

A. Yes. Peer-to-peer blocking is supported by the Cisco Wireless LAN Controller Module.

Management**Q. Is the Cisco WCS required in order to deploy Cisco Wireless LAN Controller Modules?**

A. No. The Cisco Wireless LAN Controller Module can be managed without the Cisco WCS, using a CLI or an intuitive web interface. However, when the Cisco WCS is added, all Cisco wireless LAN controllers and LWAPP-enabled access points can be centrally managed from a single console. The Cisco WCS also enables advanced management features such as location tracking, and provides heat maps for visualization of the RF environment. The extra features provided by the WCS simplify management of large-scale wireless LANs while aiding IT staff in wireless LAN operations.

Q. Does the Cisco Wireless LAN Controller Module manage the Cisco HWIC-AP WLAN interface card for Cisco 1800 and 1900 (modular), 2800, 2900, 3800, 3900 Series on a modular Integrated Service Router?

A. No. The Cisco HWIC-AP is not supported by the Cisco Wireless LAN Controllers.

Q. Can the CiscoWorks Wireless LAN Solution Engine (WLSE) manage the Cisco Wireless LAN Controller Module?

A. No, The CiscoWorks WLSE does not currently support the WLCM.

Q. What redundancy features are available for the Cisco Wireless LAN Controller Modules?**A.** The Cisco Wireless LAN Controller Modules support several redundancy features, including:

- **N+1 Controller Redundancy:** If a Cisco Wireless LAN Controller Module fails, the access points joined to that controller can automatically fail over to a secondary controller. The secondary controller may be any Cisco Wireless LAN Controller.
- **Access Point Redundancy:** If an access point fails, the Cisco Wireless LAN Controller Module automatically increases power on the neighboring access points to compensate and provide coverage.

Q. Which software releases are supported?**A.** The Cisco Wireless LAN Controller Module supports the following software releases:

- Routers: Cisco IOS Software Release 12.4(15)T or later for the integrated Wireless LAN Controllers on the 2800 and 3800 Series ISRs
- Cisco IOS Software release 15.(0).1M or later for the integrated Wireless LAN Controller on the 2900 and 3900 Series ISRs*

Q. Where can I get more information about the software features of the Cisco WLAN Controller Network Module?**A.** More information is available at

http://www.cisco.com/en/US/prod/collateral/modules/ps5949/ps6246/product_data_sheet0900aecd8028cc7b.html.

Q. Where can I get more information about Cisco Integrated Services Routers?**A.** More information is available at <http://www.cisco.com/go/isr>.**For More Information**

- For more information about the Cisco Wireless LAN Controller Module, visit <http://www.cisco.com/en/US/products/ps6730/index.html>, or contact your local account representative.
- For more information about the Cisco Unified Wireless Network, visit <http://www.cisco.com/go/unifiedwireless>.



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

CCDE, CCENT, CCSE, Cisco Eos, Cisco HealthPresence, Cisco IronPort, the Cisco logo, Cisco Lumina, Cisco Nexus, Cisco Nexus Connect, Cisco Pulse, Cisco StackPower, Cisco StadiumVision, Cisco TelePresence, Cisco Unified Computing System, Cisco WebEx, DCE, Flip Channels, Flip for Good, Flip Mini, FlipShare (Design), Flip Ultra, Flip Video, Flip Video (Design), Instant Broadband, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn, Cisco Capital, Cisco Capital (Design), Cisco Finance (Stylized), Cisco Store, and Flip Gift Card are service marks; and Access Register, Aironet, AllTouch, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCR, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Prime, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, Connum, EtherFast, EtherSwitch, Event Center, Explorer, Fast Step, Follow Me Browsing, FormShare, GainMaster, GigaDrive, HomeLink, ILYNK, Internet Quotient, IOS, IPPhone, iQuickStudy, IronPort, the IronPort logo, Laser Link, LightStream, Linksys, MediaTone, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, Network Registrar, PCNow, PIX, PowerKEY, PowerPanel, PowerTV, PowerTV (Design), PowerVu, Prime, ProConnect, ROSA, ScriptShare, SenderBase, SMARTnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TennaPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (090803)