WLC SERIES WIRELESS LAN CONTROLLERS
WLC2800, WLC880, WLC800, WLC8, WLC2

Product Overview

Today's businesses demand that network connectivity be available for users anytime, anywhere, regardless of the device they are using. The explosion of mobile devices is fueling an unprecedented need for enterprise-wide mobility. Juniper Networks WLC Series Wireless LAN Controllers deliver the highest level of wireless LAN reliability, performance, security, and management for the most demanding mobile applications and users. Companies can now build networks based on Juniper's end-to-end routing, security, and wired and wireless switching infrastructure to enable seamless mobility, improve the user experience, and increase productivity at the lowest total cost of ownership.

Product Description

Juniper Networks® WLC Series Wireless LAN Controllers meet the needs of any size network, from small branch offices or retail outlets to large enterprises and university campuses. WLC Series controllers provide users with a seamless, secure, and exceptionally reliable roaming experience wherever they are and no matter what device they are using. Identity-based networking policies enable users to have a common experience with consistent services across wide geographies.

The WLC Series is easily deployed over any existing Layer 2/Layer 3 wired network without disruption to the L2/L3 topologies, and allows secure LAN extension over the Internet to enable easy wireless deployment in branch offices.

The WLC Series controllers can also offload policy enforcement and data forwarding to Juniper Networks WLA Series Wireless LAN Access Points, resulting in optimized traffic flow, radically reduced latency, and massive scalability.

The WLC Series provides L2 Ethernet switching, per user and per service firewalls, wireless intrusion protection, 802.1Q trunking, Per-VLAN Spanning Tree Plus (PVST+), complete wired to wireless quality of service (QoS), and automated radio frequency (RF) management.

The WLC Series controllers ensure the highest wireless LAN availability in the industry. They can be configured as a Virtual Controller Cluster™ to provide many-to-many redundancy without the need for expensive hot-standby controllers. This enables nonstop wireless availability with hitless failover for all sessions, even voice calls, in the unlikely event of a controller failure.

With Juniper Networks RingMaster® wireless LAN management software, controller configurations can be obtained locally or from a remote location with automatic "no touch" deployment, and remote configuration and management capabilities.

The WLC Series delivers all of the standard security and networking functionality expected of wireless LANs with the added benefits of intelligent switching, identity-based roaming, bridging and mesh services, and nonstop wireless availability.

Architecture and Key Components

The family of WLC Series Wireless LAN Controllers consists of five products. These deliver varying levels of performance and scalability ranging from 4 to 512 access points. Controller clustering capabilities simplify configuration and enable easy network scaling, allowing massive networks of up to 32,000 access points.

Product	Description
WLC2800	• •Base license for 64 access points provided (WLC2800 can support up to 512 access points) • Offers 28 Gbps of throughput and supports up to 512 802.11n access points • 8 x GbE ports with fiber or RJ45 interfaces, and 2 x 10GbE ports • Hot-swappable redundant power supply option
WLC880	• Base license for 16 access points provided (WLC880 can support up to 256 access points) • Hardware accelerated CAPWAP ensures line-rate throughput with 3-Stream 11n access points • 8 Gbps of throughput with support for up to 256 3-Stream 802.11n access points • Provides termination of encrypted data path, allowing secured WLAN extension to branch offices with remote APs • Hardware-accelerated encryption of data path tunnels, between pairs or WLC880 or between WLC880 and remote APs • 4 x GbE SFP ports and 4 x 10/100/1000 Mbps RJ45 Ethernet ports • Redundant power supply standard
WLC800	• Base license for 16 access points provided (WLC800 can support up to 128 access points) • Hardware accelerated CAPWAP ensures line-rate throughput with 3-Stream 11n access points • 8 Gbps of throughput with support for up to 128 3-Stream 802.11n access points • 4 x GbE fiber ports and 4 x 10/100/1000 Mbps RJ45 Ethernet ports • Redundant power supply standard
WLC8	• Supports 12 access points • 8 x 10/100 Ethernet ports (6 with Power over Ethernet support) • Two models—redundant power supply standard or optional
WLC2	• Supports 4 access points • 2 x 10/100 Ethernet ports (1 with Power over Ethernet support) • No redundant power option

Features and Benefits

Secure Seamless Mobility

WLC Series Wireless LAN Controllers are designed for easy wireless integration within an existing, wired network, authentication, authorization, and accounting (AAA) security framework, requiring no changes to the existing LAN topology or configuration.

The WLC Series supports the highest levels of security for both voice and data, including IEEE 802.11i, WPA/WPA2, and Advanced Encryption Standard (AES) encryption. The WLC Series also provides comprehensive built-in Wireless Intrusion Prevention (WIP) and Wireless Intrusion Detection (WID) features to detect and mitigate rogue access points, denial of service (DoS) attacks, and other common attacks. Unlike WLAN systems that rely entirely on centralized controllers for security policy enforcement, Juniper's security/authentication model is administered centrally and enforced in a distributed fashion.

With the WLC Series controllers, up to 64 controllers of any size may be grouped to form a single Mobility Domain® which shares user session information between member controllers. This allows users to roam seamlessly from access point to access point indoors and outdoors, even across different controllers within a given Mobility Domain, without ever needing to re-authenticate.

Global Identity-Based Networking

The WLC Series controllers give users the same identity-based services and privileges, no matter where they connect. The WLC Series offers seamless roaming at a single location, and it enables the same secure mobility and consistent service profiles at multiple locations in the same network.

Applying identity-based networking globally offers great benefits to users who frequently work at different sites (for example, doctors who serve many hospitals within a hospital system, teachers across a school district, or IT users across multiple campuses). Whatever the experience a user has at one site, it can be replicated at another similar site.

Optimized Traffic Flows

WLC Series Wireless LAN Controllers also enable intelligent switching, which combines both centralized and distributed data forwarding based on the requirements of the underlying application. This results in optimized traffic flows, radically reduced latency, and massive scalability. With the scalability and performance advantages of distributed switching, the WLC Series can support the most demanding wireless applications, including voice over WLAN for thousands of users, video services, real-time location services, and 802.11n—all without the need for expensive WLAN controller upgrades.

For situations where wireless bandwidth is a scarce commodity, such as in mesh and bridging applications in which Wi-Fi is the backhaul transport, the WLC Series uses standards-based techniques such as Proxy ARP, to prevent unnecessary propagation of broadcast or multicast traffic such as Address Resolution Protocol (ARP) requests. Deep packet inspection also makes it possible to distinguish different traffic types such as Session Initiation Protocol (SIP), so that appropriate QoS and bandwidth profiles can be provided automatically.

Dynamic Load Optimization

The WLC Series optimizes per user bandwidth availability and performance by dynamically balancing traffic, regardless of whether forwarding is centralized or distributed. WLC Series controllers eliminate access point congestion problems for mobile users by automatically balancing clients across access points as they connect, and continually adjusting access point loading as users change location. WLC Series controllers also steer clients to the 5 GHz band whenever possible, preserving 2.4 GHz for legacy clients and voice services increasing usable capacity.

Nonstop Wireless Availability

The WLC Series uses controller virtualization technology to avoid service interruptions by configuring multiple controllers in a group. They act together as a single virtual controller cluster, with each controller in service at the same time. In the event of a controller being out of service, the many-to-many redundancy allows the access points previously assigned to the offline controller to be redistributed among other controllers in the cluster instantaneously. With this unique hitless failover capability, no active sessions or voice calls are lost. This nonstop wireless experience also makes it possible for in-service upgrades, adds, moves, and changes with zero downtime.

Spectrum Aware

WLC Series controllers play a key role in rogue and intrusion detection as well as DoS attack detection. Working in conjunction with access points, the controllers systematically scan all 802.11 channels while simultaneously providing client services. When rogue or interference sources are detected, the WLC Series controllers coordinate the appropriate mitigation response to ensure the highest air quality for efficient and high performing wireless access services. If an access point goes out of service and leaves a coverage hole, WLC Series controllers can change channels or adjust power levels on multiple nearby access points in a coordinated fashion in order to restore Wi-Fi coverage.

Advanced Voice Services

WLC Series Wireless LAN Controllers support all of the standards necessary to deliver secure, scalable voice services with seamless roaming across the entire mobility system.

The highly distributed architecture of the WLC Series is optimized for high quality voice services, allowing voice traffic to take the shortest, most efficient path, and avoiding the risk of congestion and added latency caused by centralized forwarding at the WLAN controller.

In addition to hitless failover capabilities which provide voice reliability equal to wired networks, the WLC Series provides SIP packet inspection, dynamic call admission control (CAC), and much more for resource provisioning, troubleshooting, scalability, and mass deployment of reliable voice services.

Branch and Remote Office WLAN Extension

The WLC Series wireless LAN controllers allow easy and rapid deployment of secure wireless LAN services in retail and branch offices, with a "remote AP" at the branch. Customers can deploy and manage access points (APs) at each romote location over a WAN link without requiring a controller in each site. APs at each remote site can switch traffic locally. If the connection to the controller is lost, wireless services continue uninterrupted; connected clients maintain wireless connection to the AP, new clients can connect and authenticate locally, and the Wireless Intrusion Detection System (WIDS) continues. Furthermore, the new country code override feature in the remote AP profile allows the AP's channel and transmit power to be set to meet the specific country's regulatory requirement where it is located, independent of the location of the WLAN controller which is managing it.

This simplified branch office deployment model eliminates all complexity, while leveraging the investment in corporate security infrastructure and policies.

Bridging and Mesh Services

The WLC Series controllers also extend wireless coverage between buildings and across difficult to reach uncarpeted areas indoors and outdoors through point-to-point bridging and wireless mesh services for both indoor and outdoor access points.

WLC2

WLC8

WLC800

WLC880

WLC2800

Features

	WLC2800	WLC880	WLC800	WLC8	WLC2
Scalability and Reliability					
Number of Managed Access Points					
Base AP licenses provided	64	16	16	12	4
Maximum AP licenses supported	512	256	128	12	4
Additional license increments	64 or 128	16 or 32	16 or 32	N/A	N/A
Platform Reliability					
Redundant power module standard		✓	✓	✓ (single PSU version also available)	
Hot pluggable redundant power supply	✓				
Network Reliability					
EtherChannel™ load-shared, redundant links	✓	✓	✓	✓	✓
Spanning tree and per-VLAN spanning tree (PVST+)	✓	✓	✓	✓	✓
Resilient network attachment via any WLC Series port	✓	✓	✓	✓	✓
N:1 and N:N redundant WLC Series capabilities	✓	✓	✓	✓	✓
Security					
Authentication					
Supports complete local AAA authentication, including 802.1x, as primary or backup to a centralized AAA server	✓	✓	✓	✓	✓
Supports multiple AAA server groups and can load share across multiple AAA servers or within a server group	✓	✓	✓	✓	✓
Generates and manages X.509 digital certificates	✓	✓	✓	✓	✓
Assigns and enforces per-user authorization policies that are managed centrally from the AAA back-end	✓	✓	✓	✓	✓
Authorizations include virtual private group membership, personal firewall filters, time-of-day/day-of-week access, encryption type, and location-specific policies	✓	✓	✓	✓	✓
IEEE 802.1x with multiple EAP types (TLS, PEAP/MSCHAP, TTLS)	✓	✓	✓	✓	✓
WebAAA, MAC, Open	✓	✓	✓	✓	✓
Encryption and Key Management					
Encryption distributed in WLA Series access points	✓	✓	✓	✓	✓
WLC Series generates master and session keys	✓	✓	✓	✓	✓
Provides key management for each encryption technique	✓	✓	✓	✓	✓
Encrypted control and data tunnels	✓	✓	✓	✓	✓
Hardware-assisted AES encrypted tunnels		✓			
Management and Control					
Management Access					
Command Line Interface (Console serial port, telnet, SSHv2)	✓	✓	✓	✓	✓
WebView web access (https)	✓	✓	✓	✓	✓
SSL, XML (to Juniper Networks RingMaster)	✓	✓	✓	✓	✓
SNMP v1, v2c, v3	✓	✓	✓	✓	✓
Syslog support for system monitoring	✓	✓	✓	✓	✓
Detailed audit logging for change control	✓	✓	✓	✓	✓
Remote packet capture ability for advanced troubleshooting	✓	✓	✓	✓	✓
RF Management					
Automated access point power/channel auto-tuning	✓	✓	✓	✓	✓
User Management and Statistics					
Detailed per user per session RF accounting statistics and management	✓	✓	✓	✓	✓
Tracks the location, roaming history, virtual private group, network addresses, state, activity, errors, usage and other attributes by user name, session, VLAN, or user group	✓	✓	✓	✓	✓
Provides per user audit trail and chargeback capability through the accounting component of AAA	✓	✓	✓	✓	✓

Features (continued)

	WLC2800	WLC880	WLC800	WLC8	WLC2
Access Point Management and Control					
Configures and controls access points; controls third-party APs	✓	✓	✓	✓	✓
The WLC Series are categorized as access controllers (AC) that support direct, switched, and routed connections	✓	✓	✓	✓	✓
Enables data forwarding in WLC Series or in access points	✓	✓	✓	✓	✓
Multiple WLC Series controllers provide resilient control	✓	✓	✓	✓	✓
Boot, configuration and management compliant with the IETF CAPWAP architecture	✓	✓	✓	✓	✓

Specifications

	WLC2800	WLC880	WLC800	WLC8	WLC2
Hardware Specifications					
Dimensions (W x D x H)	17.4 in x 18 in x 2.594 in	17.32in x 14.78 in x 1.74 in	17.32in x 14.78 in x 1.74 in	17.4 in x 12.1 in x 1.7 in	7.5 in x 5.75 in x 1.25 in
	(44.19 cm x 45.72 cm x 6.58 cm)	(44 cm x 37.54 cm x 4.42 cm)	(44 cm x 37.54 cm x 4.42 cm)	(44.2 cm x 30.7 cm x 4.3 cm)	(19 cm x 14.6 cm x 3.2 cm)
Weight					
With one power supply	18 lb (8.1 kg)			8.5 lb (3.8 kg)	1.5 lb (0.7 kg)
With two power supplies	19.5 lb (8.77 kg)	11.6 lb (5.2 kg)	11.6 lb (5.2 kg)	9.5 lb (4.3 kg)	
Interfaces					
10 Gigabit Ethernet ports	2				
Gigabit Ethernet ports with both SFP and RJ45 interfaces	8				
Gigabit Ethernet Small Form-Factor Pluggable (SFP) ports		4	4		
10/100/1000 Mbps Ethernet RJ45 ports		4	4		
10/100 Fast Ethernet ports with integrated Power-over-Ethernet (PoE)				6	1
10/100 Fast Ethernet ports without Power-over-Ethernet (PoE)				2	1
Operating Temperature					
32º to 104º F (0º to 40º C)	✓	✓	✓		
14º to 122º F (0º to 50º C)				✓	✓
Storage Temperature					
-40º to 158º F (-40º to 70º C)	✓				
-4º to 158º F (-20º to 70º C)		✓	✓	✓	✓
Humidity: 5% to 95% (noncondensing)		✓	✓	✓	✓
Power					
Peak power with dual PSUs	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz	93-132 VAC, 180-264 VAC, 50-60 Hz	100-240 VAC, 47-63 Hz
Power output	108 W	93.4 W	93.4 W	125 W	Output: 48 VDC 0.75 A
Max. amperage draw	4.4 Arms at 120 Vrms, 2.2 Arms at 230 Vrms	2.0 Arms at 120 Vrms, 1.0 Arms at 230 Vrms	2.0 Arms at 120 Vrms, 1.0 Arms at 230 Vrms	4.0 Arms at 115 Vrms, 2.0 Arms at 230 Vrms	0.8 Arms at 115 Vrms
Standards Requirements					
Regulatory Safety					
CSA 60950-1	✓	✓	✓	✓	✓
EN 60950-1	✓			✓	✓
CSA C22.2 60950-1-3	✓	✓	✓		

Specifications (continued)

	WLC2800	WLC880	WLC800	WLC8	WLC2
EMI/EMC					
FCC Part 15 Class A	✓	✓	✓	✓	Class B
ICES Class A	✓	✓	✓	ICES 003	ICES 003
VCCI Class A	✓	✓	✓	✓	✓
EN 55022 Class A	✓	✓	✓	✓	✓
EN 55024	✓	✓	✓	✓	✓
EN 60601-1-2	✓	✓	✓	✓	✓
CISPR 22 Class A	✓	✓	✓	✓	✓
Taiwan: CNS 13438 Class A	✓	✓	✓	✓	✓
China: CCC GB 9254-88 Class A	✓	✓	✓	✓	✓
Australia/New Zealand: AS/NZ 3548 Class A	✓	✓	✓	✓	✓
IEEE Standards	✓	✓	✓	✓	✓
802.1x Port-Based Network Access Control	✓	✓	✓	✓	✓
802.3i 10BASE-T Ethernet	✓	✓	✓	✓	✓
802.3u 100BASE-T Fast Ethernet	✓	✓	✓	✓	✓
802.3ab 1000BASE-TX Gigabit Ethernet	✓	✓	✓	✓	✓
802.3af Power over Ethernet (Class 3)	✓	✓	✓	✓	✓
802.11 a/b/g/n, 802.11d, 802.11e, 802.11h, 802.11i	✓	✓	✓	✓	✓
802.1D Spanning Tree	✓	✓	✓	✓	✓
802.1Q VLAN tagging	✓	✓	✓	✓	✓
802.3ad (static config)	✓	✓	✓	✓	✓

Juniper Networks Services and Support

Juniper Networks is the leader in performance-enabling services that are designed to accelerate, extend, and optimize your high-performance network. Our services allow you to maximize operational efficiency while reducing costs and minimizing risk, achieving a faster time to value for your network. Juniper Networks ensures operational excellence by optimizing the network to maintain required levels of performance, reliability, and availability. For more details, please visit **www.juniper.net/us/en/products-services**.

Ordering Information

Model Number	Description
WLC2 Hardware	
WLC2	Wireless LAN controller with 2 x 10/100BASE-T ports (1 PoE), single external PSU brick, and support for 4 APs.
WLC2 Advanced Feature Licenses	
WLCR2-VO-RTU	Voice Module license for WLC2. Requires software version 7.1 or later.
WLCR2-HA-RTU	High Availability Module license for WLC2. Requires software version 7.1 or later.
WLC8 Hardware	
WLC8	Wireless LAN controller with 8 x 10/100BASE-T ports (6 PoE), single integrated PSU and support for 12 APs.
WLC8R	Wireless LAN controller with 8 x 10/100BASE-T ports (6 PoE), dual integrated PSU and support for 12 APs.
WLC8 Advanced Feature Licenses	
WLC8-VO-RTU	Voice Module license for WLC8. Requires software version 7.1 or later.
WLC8-HA-RTU	High Availability Module license for WLC8. Requires software version 7.1 or later.
WLC880 Hardware	
WLC880R	Wireless LAN controller with 4 x Gigabit Ethernet (SFP) ports and 4 x 10/100/1000BASE-T (RJ-45) ports, including dual PSU and 16 AP licenses.
WLC880 Transceivers	
WLC-SFP-SX	1000BASE-SX SFP transceiver, LC duplex connector, short wavelength (850 nm), <220 m over 50/125 μm MMF, <550 m over 62.5/125 μm MMF.
WLC-SFP-LX	1000BASE-LX SFP transceiver, LC duplex connector, long wavelength (1300 nm), <10 km over SMF.
WLC-SFP-UTP	1000BASE-T SFP transceiver, RJ-45 connector, <100 m over Cat5 UTP cable.
WLC880 Access Point Licenses	
WLC880-U16	16 AP license upgrade for WLC880R (max. 256 APs).
WLC880-U32	32 AP license upgrade for WLC880R (max. 256 APs).
WLC880 Advanced Feature Licenses	
WLC880-VO-RTU	Voice Module license for WLC880R. Requires software version 7.5 or later.
WLC880-HA-RTU	High Availability Module license for WLC880R. Requires software version 7.5 or later.
WLC800 Hardware	
WLC800R	Wireless LAN controller with 4 x Gigabit Ethernet (SFP) ports and 4 x 10/100/1000BASE-T (RJ-45) ports, including dual PSU and 16 AP licenses.

Model Number	Description
WLC800 Transceivers	
WLC-SFP-SX	1000BASE-SX SFP transceiver, LC duplex connector, short wavelength (850 nm), <220 m over 50/125 μm MMF, <550 m over 62.5/125 μm MMF.
WLC-SFP-LX	1000BASE-LX SFP transceiver, LC duplex connector, long wavelength (1300 nm), <10 km over SMF.
WLC-SFP-UTP	1000BASE-T SFP transceiver, RJ-45 connector, <100 m over Cat5 UTP cable.
WLC800 Access Point Licenses	
WLC800-U16	16 AP license upgrade for WLC800R (max. 128 APs).
WLC800-U32	32 AP license upgrade for WLC800R (max. 128 APs).
WLC800 Advanced Feature Licenses	
WLC800-VO-RTU	Voice Module license for WLC800R. Requires software version 7.3 or later.
WLC800-HA-RTU	High Availability Module license for WLC800R. Requires software version 7.3 or later.
WLC2800 Hardware	
WLC2800	Wireless LAN controller with two 10GbE XFP ports and 8 x 1000BASE-T (RJ-45 and SFP) ports, including single PSU and 64 AP license.
WLC2800-PSU	PSU for WLC2800 redundant power or spare.
WLC2800 Transceivers	
WLC-SFP-SX	1000BASE-SX SFP transceiver, LC duplex connector, short wavelength (850 nm), <220 m over 50/125 μm MMF, <550 m over 62.5/125 μm MMF.
WLC-SFP-LX	1000BASE-LX SFP transceiver, LC duplex connector, long wavelength (1300 nm), <10 km over SMF.
WLC-SFP-UTP	1000BASE-T SFP transceiver, RJ-45 connector, <100 m over Cat5 UTP cable.
WLC-XFP-SR	10GbE XFP SR transceiver, LC duplex connector, short wavelength (850 nm), <220 m over 50/125 μm MMF, <550 m over 62.5/125 μm MMF.
WLC-XFP-LR	10GbE XFP LR transceiver, LC duplex connector, long wavelength (1300 nm), <10 km over SMF.
WLC2800 Access Point Licenses	
WLC2800-U64	64 AP license upgrade for WLC2800 (max. 512 APs).
WLC2800-U128	128 AP license upgrade for WLC2800 (max. 512 APs).
WLC2800 Advanced Feature Licenses	
WLC2800-VO-RTU	Voice Module license for WLC2800. Requires software version 7.1 or later.
WLC2800-HA-RTU	High Availability Module license for WLC2800. Requires software version 7.1 or later.

Model Number	Description
Access Point Feature Licenses	
WLC-MESH-U4	Voice Module license for WLC2800. Requires software version 7.1 or later.
WLC-MESH-U12	Mesh Module license for 12 APs. Requires software version 7.1 or later.
WLC-MESH-U32	Mesh Module license for 32 APs. Requires software version 7.1 or later.
WLC-SPECTRUM-U1	Spectrum Analysis Module License for 1 AP. Requires software version 7.5 or later.
WLC-SPECTRUM-U4	Spectrum Analysis Module License for 4 APs. Requires software version 7.5 or later.
WLC-SPECTRUM-U16	Spectrum Analysis Module License for 16 APs. Requires software version 7.5 or later.
WLC-SPECTRUM-U32	Spectrum Analysis Module License for 32 APs. Requires software version 7.5 or later.

About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at **www.juniper.net**.

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