Cisco Catalyst 9115 Series Wi-Fi 6 Access Points

© 2021 Cisco and/or its affiliates. All rights reserved.

Contents

© 2021 Cisco and/or its affiliates. All rights reserved.

The Cisco® Catalyst® 9115 Series with Wi-Fi 6is the next generation of enterprise access points. They are resilient, secure, and intelligent.

Hyperconnectivity with steady performance in demanding environments. Exponential growth of Internet of Things (IoT) devices and next-generation applications. Advanced persistent security threats. All of these require a wireless network that provides resiliency and superior connectivity, integrated security with advanced classification and containment, and hardware and software innovations to automate, secure, and simplify networks. Updating your wireless infrastructure to one that will meet these needs is paramount for today's digital business. The new generation of Cisco Catalyst 9100 Access Points, with high-performance Wi-Fi 6 (802.11ax) capabilities and innovations in RF performance, security, and analytics, enables end-to-end digitization and helps accelerate the rollout of business services by delivering beyond Wi-Fi.

Extending Cisco's intent-based network and perfect for networks of all sizes, the Catalyst 9115 Series scales to meet the growing demands of IoT while fully supporting the latest innovations and new technologies. The Catalyst 9115 Series is also a leader in performance, security, and analytics.

The Catalyst 9115 Series Access Points, paired with the Cisco Digital Network Architecture (Cisco DNA), are enterprise-class products that will address both your current and future needs. They are the first step in updating your network to take better advantage of all of the features and benefits that Wi-Fi 6 provides.

With the Catalyst 9115 Series, you can secure remote workers or the micro-office. Any Cisco Aironet or Catalyst access point can function as an OfficeExtend Access Point (OEAP). With an OEAP, an employee at home or in a temporary micro-office will have access to the corporate SSID and the corporate network without the need to set up a VPN or have any advanced technical know-how.

© 2021 Cisco and/or its affiliates. All rights reserved.

Table 1. Features and benefits

Feature	Benefits
802.11ax (Wi-Fi 6)	The IEEE 802.11ax emerging standard, also known as High-Efficiency-Wireless (HEW) or Wi-Fi 6, builds on 802.11ac. It will deliver a better experience in typical environments and more predictable performance for advanced applications such as 4K or 8K video, high-density, high-definition collaboration apps, all-wireless offices, and IoT. 802.11ax is designed to use both the 2.4-Ghz and 5-GHz bands, unlike the 802.11ac standard.
Uplink/downlink OFDMA	OFDMA-based scheduling splits the bandwidth into smaller chunks called Resource Units (RUs), which can be allocated to individual clients in both the downlink and uplink directions to reduce overhead and latency.
MU-MIMO technology	Supporting four spatial streams, MU-MIMO enables access points to split spatial streams between client devices, to maximize throughput.
BSS coloring	Spatial reuse (also known as Basic Service Set [BSS] coloring) allows the Access Points (APs) and their clients to differentiate between BSSs, thus permitting more simultaneous transmissions.
Target wake time	A new power savings mode called Target Wake Time (TWT) allows the client to stay asleep and to wake up only at prescheduled (target) times to exchange data with the AP. This offers significant energy savings for battery-operated devices, up to 3x to 4x compared to 802.11n and 802.11ac.
Cisco Embedded Wireless Controller	The 9115 Wi-Fi 6 access points are available with a built-in controller. The Cisco Embedded Wireless Controller on Catalyst 9100 Access Points provides an easy-to-deploy and manage option that does not require a physical appliance. The control resides on the access point, so there is no added footprint or complexity. And because it uses Cisco Catalyst 9800 Series code, it's easy to migrate your network as your needs grow. For more details refer to EWC
User Defined Network	A feature available in Cisco DNA Center, allows IT to give end users control of their very own wireless network partition on a shared network. End users can then remotely and securely deploy their devices on this network. Perfect for university dormitories or extended hospital stays, Cisco User Defined Network grants both device security and control, allowing each user to choose who can connect to their network. (Available second half of calendar year 2020.) For more details refer to UDN
Application Hosting on Catalyst 9100 Access	Application Hosting on Catalyst 9100 Access Points helps future-proof and simplify IoT deployments by eliminating the need to install and manage overlay networks. Utilizing the USB interface, containerized applications and hardware modules can be deployed to reduce cost and complexity. Adding Cisco DNA Center provides workflows and deployment-wide application lifecycle management.
Multigigabit Ethernet support	Provides uplink speeds of 2.5 Gbps, in addition to 100 Mbps and 1 Gbps. All speeds are supported on Category 5e cabling for an industry first, as well as 10GBASE-T (IEEE 802.3bz) cabling.
Bluetooth 5.0	Integrated Bluetooth Low Energy (BLE) 5.0 radio to enable IoT use cases such as location tracking and wayfinding.

© 2021 Cisco and/or its affiliates. All rights reserved.

Feature	Benefits
Apple features	Apple and Cisco have partnered to create an optimal mobile experience for iOS devices on corporate networks based on Cisco technologies. Using new features in iOS 10, in combination with the latest software and hardware from Cisco, businesses can now more effectively use their network infrastructure to deliver an enhanced user experience across all business applications. At the center of the collaboration is a unique handshake between the Cisco WLAN and Apple devices. This handshake enables the Cisco WLAN to provide an optimal Wi-Fi roaming experience to Apple devices. Additionally, the Cisco WLAN trusts Apple devices and gives priority treatment for business-critical applications specified by the Apple device. This feature is also known as Fast Lane.

For more details about Wi-Fi 6, see Cisco's technical white paper on Wi-Fi 6.

For more details about C9115 feature support, see Cisco's Feature Matrix.

Secure infrastructure

Trustworthy systems built with Cisco Trust Anchor Technologies provide a highly secure foundation for Cisco products. With the Cisco Catalyst 9100 Access Points, these technologies enable hardware and software authenticity assurance for supply chain trust and strong mitigation against man-in-the-middle attacks that compromise software and firmware. Trust Anchor capabilities include:

- **Image signing**
- **Secure Boot**
- **Cisco Trust Anchor module**

Cisco DNA support

Pairing the Cisco Catalyst 9115 Series Access Points with Cisco DNA allows for a total network transformation. Cisco DNA allows you to truly understand your network with real-time analytics, quickly detect and contain security threats, and easily provide networkwide consistency through automation and virtualization. The Catalyst 9115 Series Access Points support SD-Access, Cisco's leading enterprise architecture.

Working together, the Cisco Catalyst 9115 Series and Cisco DNA offer such features as:

- Cisco DNA Spaces
- Cisco Identity Services Engine
- Cisco DNA Analytics and Assurance

The result? Your network stays relevant, becomes digital ready, and is the lifeblood of your organization.

Note: For information about Cisco DNA, refer to the Cisco DNA

© 2021 Cisco and/or its affiliates. All rights reserved.

Product specifications

Table 2. Specifications

Item	Specification
Part numbers	**Cisco Catalyst 9115AXI Access Point: Indoor environments, with internal antennas** • C9115AXI-x: Cisco Catalyst 9115 Series **Cisco Catalyst 9115AXE Access Point: Indoor, challenging environments, with external antennas** • C9115AXE-x: Cisco Catalyst 9115 Series **Cisco Catalyst 9115AXI Access Point: Indoor environments, with internal antennas, with embedded wireless controller** • C9115AXI-EWC-x: Cisco Catalyst 9115 Series **Cisco Catalyst 9115AXE Access Point: Indoor, challenging environments, with external antennas, with embedded wireless controller** • C9115AXE-EWC-x: Cisco Catalyst 9115 Series **Regulatory domains: (x = regulatory domain)** Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit https://www.cisco.com/go/aironet/compliance. Not all regulatory domains have been approved. As they are approved, the part numbers will be available on the Global Price List. **Cisco Wireless LAN Services** • AS-WLAN-CNSLT: Cisco Wireless LAN Network Planning and Design Service • AS-WLAN-CNSLT: Cisco Wireless LAN 802.11n Migration Service • AS-WLAN-CNSLT: Cisco Wireless LAN Performance and Security Assessment Service
Software	• Cisco Unified Wireless Network Software Release 8.9 or later • Cisco IOS® XE Software Release 16.11 or later
Supported wireless LAN controllers	• Cisco Catalyst 9800 Series Wireless Controllers • Cisco 3500, 5520, and 8540 Series Wireless Controllers and Cisco Virtual Wireless Controller
802.11n version 2.0 (and related) capabilities	• 4x4 MIMO with four spatial streams • Maximal Ratio Combining (MRC) • 802.11n and 802.11a/g beamforming • 20- and 40-MHz channels • PHY data rates up to 800 Mbps (40 MHz with 5 GHz and 20 MHz with 2.4 GHz) • Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • 802.11 Dynamic Frequency Selection (DFS) • Cyclic Shift Diversity (CSD) support

© 2021 Cisco and/or its affiliates. All rights reserved.

Item	Specification
802.11ac	• 4x4 downlink MU-MIMO with four spatial streams • MRC • 802.11ac beamforming • 20-, 40-, 80-, and 160-MHz channels • PHY data rates up to 3.47 Gbps (160 MHz with 5 GHz) • Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • 802.11 DFS • CSD support
802.11ax	• 4x4 downlink MU-MIMO with four spatial streams • Uplink/downlink OFDMA • TWT • BSS coloring • MRC • 802.11ax beamforming • 20-, 40-, 80-, and 160-MHz channels • PHY data rates up to 5.38 Gbps (160 MHz with 5 GHz and 20 MHz with 2.4 GHz) • Packet aggregation: A-MPDU (transmit and receive), A-MSDU (transmit and receive) • 802.11 DFS • CSD support
Integrated antenna	• 2.4 GHz, peak gain 3 dBi, internal antenna, omnidirectional in azimuth • 5 GHz, peak gain 4 dBi, internal antenna, omnidirectional in azimuth
External antenna (sold separately)	• Cisco Catalyst 9115E Access Points are certified for use with antenna gains up to 6 dBi (2.4 GHz and 5 GHz) • Cisco offers the industry's broadest selection of antennas, delivering optimal coverage for a variety of deployment scenarios • For more details, C9115 Guide
Interfaces	• 1x 100, 1000, 2500 Multigigabit Ethernet (RJ-45) – IEEE 802.3bz • Management console port (RJ-45) • USB 2.0
Indicators	• Status LED indicates boot loader status, association status, operating status, boot loader warnings, and boot loader errors
Dimensions (W x L x H)	• Access point (without mounting brackets): C9115I: 8.0 x 8.0 x 1.5 in. (20.3 x 20.3 x 3.8 cm), C9115E: 8.0 x 8.0 x 1.7 in. (20.3 x 20.3 x 4.3 cm)
Weight	**Cisco Catalyst 9115AXI** • 1.98 lb (0.9 kg) **Cisco Catalyst 9115AXE** • 2.43 lb (1.1 kg)
Input power requirements	• 802.3at Power over Ethernet Plus (PoE+), 802.3bt Cisco Universal PoE (Cisco UPOE+, Cisco UPOE®) • Cisco power injector, AIR-PWRINJ6= • 802.3af PoE • Cisco power injector, AIR-PWRINJ5= (Note: This injector supports only 802.3af) **Note:** When 802.3af PoE is the source of power, both 2.4-GHz and 5-GHz radios will be reduced to 2x2 and Ethernet downgraded to 1 Gigabit Ethernet. In addition, the USB port will be off.

© 2021 Cisco and/or its affiliates. All rights reserved.

Item	Specification
Power draw	**802.3at full feature – Catalyst 9115I** Power source: PoE; Power type: 802.3at; 2.4-GHz radio: 4x4; 5-GHz radio: 4x4; Link speed: 2.5G; USB: Y; LLDP: 20.4W **802.3at full feature – Catalyst 9115E** Power source: PoE; Power type: 802.3at; 2.4-GHz radio: 4x4; 5-GHz radio: 4x4; Link speed: 2.5G; USB: Y; LLDP: 21.4W **802.3af reduced feature** Power source: PoE; Power type: 802.3af; 2.4-GHz radio: 2x2; 5-GHz radio: 2x2; Link speed: 1G; USB: N; LLDP: 13W **Note:** Power required at the Power Source Equipment (PSE) will depend on the cable length and other environmental issues.
Environmental	**Cisco Catalyst 9115AXI** • Nonoperating (storage) temperature: -22° to 158°F (-30° to 70°C) • Nonoperating (storage) altitude test: 25°C, 15,000 ft. • Operating temperature: 32° to 122°F (0° to 50°C) • Operating humidity: 10% to 90% (noncondensing) • Operating altitude test: 40°C, 9843 ft. **Note:** When the ambient operating temperature exceeds 40°C, the access point will shift from 4x4 to 2x2 on both the 2.4-GHz and 5-GHz radios, uplink Ethernet will downgrade to 1 Gigabit Ethernet, and the USB interface will be disabled. **Cisco Catalyst 9115AXE** • Nonoperating (storage) temperature: -22° to 158°F (-30° to 70°C) • Nonoperating (storage) altitude test: 25°C, 15,000 ft. • Operating temperature: +6° to 122°F (+20° to 50°C) • Operating humidity: 10% to 90% (noncondensing) • Operating altitude test: 40°C, 9843 ft.
System memory	• 2048 MB DRAM • 1024 MB flash
Warranty	Limited lifetime hardware warranty
Available transmit power settings	**2.4 GHz** • 23 dBm (200 mW) • +4dBm (0.39mW) **5 GHz** • 23 dBm (200 mW) • +4dBm (0.39mW)
Regulatory domains	**Note: Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit https://www.cisco.com/go/aironet/compliance**

© 2021 Cisco and/or its affiliates. All rights reserved.

Item	Specification
Compliance standards	For information about Regulatory Domain support, refer to the Cisco Regulatory Domain White Paper • **Safety:** - IEC 60950-1 - EN 60950-1 - UL 60950-1 - CAN/CSA-C22.2 No. 60950-1 - AS/NZS 60950-1 - UL 2043 - Class III equipment • **Emissions:** - CISPR 32 (rev. 2015) - EN 55032 (rev. 2012/AC:2013) - EN 55032 (rev. 2015) - EN61000-3-2 (rev. 2014) - EN61000-3-3 (rev. 2013) - KN61000-3-2 - KN61000-3-3 - AS/NZS CISPR 32 Class B (rev. 2015) - 47 CFR FCC Part 15B - ICES-003 (rev. 2016 Issue 6, Class B) - VCCI (V3) - CNS (rev. 13438) - KN-32 - TCVN 7189 (rev. 2009) • **Immunity:** - CISPR 24 (rev. 2010) - EN 55024/EN 55035 (rev. 2010) • **Emissions and Immunity:** - EN 301 489-1 (v2.1.1 2017-02) - EN 301 489-17 (v3.1.1 2017-02) - QCVN (16:2014) - KN 489-1 - KN 489-17 - EN 60601 (1-1:2015) • **Radio:** - EN 300 328 (v2.1.1) - EN 301 893 (v2.1.1) - AS/NZS 4268 (rev. 2017) - 47 CFR FCC Part 15C, 15.247, 15.407 - RSP-100 - RSS-GEN - RSS-247 - China regulations SRRC - LP0002 (rev 2018.1.10) - Japan Std. 33J, Std. 66, and Std. 71 • **RF safety:** - EN 50385 (rev. Aug 2002) - ARPANSA - AS/NZS 2772 (rev. 2016) - EN 62209-1 (rev. 2016) - EN 62209-2 (rev. 2010) - 47 CFR Part 1.1310 and 2.1091 - RSS-102 • **IEEE standards:** - IEEE 802.3 - IEEE 802.3ab - IEEE 802.3af/at - IEEE 802.11 a/b/g/n/ac/ax - IEEE 802.11h, 802.11d • **Security:** - 802.11i, Wi-Fi Protected Access 3 (WPA3), WPA2, WPA - 802.1X - Advanced Encryption Standard (AES) • **Extensible Authentication Protocol (EAP) types:** - EAP-Transport Layer Security (TLS) - EAP-Tunneled TLS (TTLS) or Microsoft Challenge Handshake Authentication Protocol Version 2 (MSCHAPv2) - Protected EAP (PEAP) v0 or EAP-MSCHAPv2 - EAP-Flexible Authentication via Secure Tunneling (EAP-FAST) - PEAP v1 or EAP-Generic Token Card (GTC) - EAP-Subscriber Identity Module (SIM)
Datarate/Transmit Power/ Receive sensitivity	For more detailed information about Datarate/TX Power/Receive sensitivity, Please refer Cisco RF Details

© 2021 Cisco and/or its affiliates. All rights reserved.

Item	Specification				
Transmit power and receive sensitivity					
		5-GHz radio		2.4-GHz radio	
	Spatial streams	Total transmit power (dBm)	Receive sensitivity (dBm)	Total transmit power (dBm)	Receive sensitivity (dBm)
802.11/11b					
1 Mbps	1	-	-	23	-98
11 Mbps	1	-	-	23	-90
802.11a/g					
6 Mbps	1	23	-96	23	-95
24 Mbps	1	23	-87	23	-85
54 Mbps	1	23	-76	23	-76
802.11n HT20					
MCS0	1	23	-95	23	-94
MCS31	4	23	-70	23	-70
802.11n HT40					
MCS0	1	23	-93	-	-
MCS31	4	23	-68	-	-
802.11ac VHT20					
MCS0	1	23	-95	-	-
MCS9	1	22	NA	-	-
MCS0	2	23	-92	-	-
MCS9	2	22	NA	-	-
MCS0	3	23	-91	-	-
MCS9	3	22	-67	-	-
MCS0	4	23	-90	-	-
MCS9	4	22	-66	-	-

© 2021 Cisco and/or its affiliates. All rights reserved.

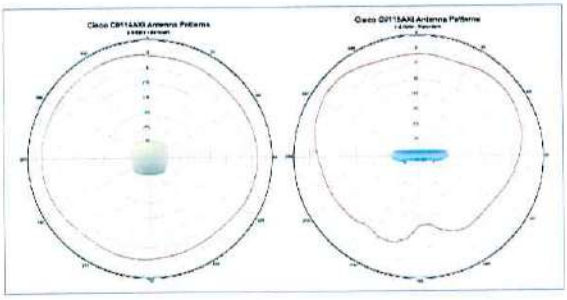
Item	Specification				
11ac VHT40					
	1	23	-89	-	-
MCS9	1	22	-65	-	-
MCS0	2	23	-86	-	-
MCS9	2	22	-62	-	-
MCS0	3	23	-85	-	-
MCS9	3	22	-61	-	-
MCS0	4	23	-84	-	-
MCS9	4	22	-59	-	-
802.11ac VHT80					
MCS0	1	23	-84	-	-
MCS9	1	22	-60	-	-
MCS0	2	23	-81	-	-
MCS9	2	22	-57	-	-
MCS0	3	23	-80	-	-
MCS9	3	22	-55	-	-
MCS0	4	23	-77	-	-
MCS9	4	22	-54	-	-
802.11ac VHT160					
MCS0	1	23	-84	-	-
MCS9	1	21	-59	-	-
MCS0	2	23	-85	-	-
	2	21	-57	-	-
	3	23	-85	-	-
MCS9	3	21	-55	-	-
MCS0	4	23	-85	-	-
MCS9	4	21	-53	-	-

© 2021 Cisco and/or its affiliates. All rights reserved.

Item	Specification				
802.11ax VHT20					
MCS0	1	23	-94	23	-93
MCS11	1	21	-64	20	-62
MCS0	2	23	-91	23	-90
MCS11	2	21	-61	20	-59
MCS0	3	23	-90	23	-88
MCS11	3	21	-60	20	-58
MCS0	4	23	-87	23	-85
MCS11	4	21	-59	20	-57
802.11ax VHT40					
MCS0	1	23	-92	23	-91
MCS11	1	21	-60	20	-60
MCS0	2	23	-89	23	-87
MCS11	2	21	-57	20	-57
MCS0	3	23	-88	23	-85
MCS11	3	21	-56	20	-55
MCS0	4	23	-86	23	-83
MCS11	4	21	-54	20	-54
802.11ax VHT80					
MCS0	1	23	-87	-	-
MCS11	1	21	-58	-	-
MCS0	2	23	-84	-	-
MCS11	2	21	-55	-	-
MCS0	3	23	-83	-	-
MCS11	3	21	-54	-	-
MCS0	4	23	-81	-	-
MCS11	4	21	-52	-	-

© 2021 Cisco and/or its affiliates. All rights reserved.

Item		Specification			
802.11ax VHT160					
MCS0	1	23	-84	-	-
MCS11	1	20	-56	-	-
MCS0	2	23	-81	-	-
MCS11	2	20	-52	-	-
MCS0	3	23	-80	-	-
MCS11	3	20	-51	-	-
MCS0	4	23	-78	-	-
MCS4	4	23	-67	-	-
MCS7	4	23	-60	-	-
MCS8	4	21	-57	-	-
MCS9	4	21	-55	-	-
MCS10	4	20	-51	-	-
MCS11	4	20	-49	-	-



© 2021 Cisco and/or its affiliates. All rights reserved.

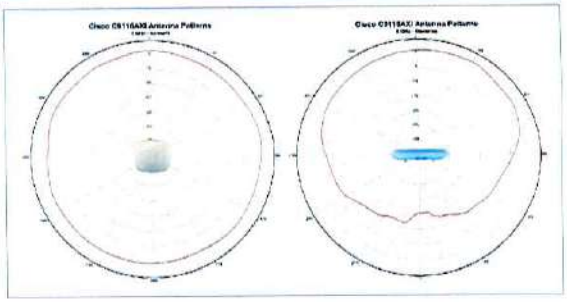


Figure 1.
Antenna radiation pattern

For information about feature support, please refer to the Cisco Catalyst 9100 Release Notes.

Licensing

For information about Licensing and packaging, refer to Cisco Licensing.

Warranty information

The Cisco Catalyst 9115 Series Access Points come with a limited lifetime warranty that provides full warranty coverage of the hardware for as long as the original end user continues to own or use the product. The warranty includes 10-day advance hardware replacement and ensures that software media are defect-fr 90 days. For more details, visit https://www.cisco.com/go/warranty.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report. Reference links to information are below.

Information on product material content laws and regulations - Materials.

Information on electronic waste laws and regulations, including products, batteries, and packaging - WEEE compliance.

Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

© 2021 Cisco and/or its affiliates. All rights reserved.

Cisco Services

With Cisco Services, you can achieve infrastructure excellence faster with less risk. From an initial WLAN readiness assessment to implementation, full solution support, and in-depth training, our services for the Cisco Catalyst 9115 Series provide expert guidance to help you successfully plan, deploy, manage, and support your new access points. With unmatched networking expertise, best practices, and innovative tools, Cisco Services can help you reduce overall upgrade, refresh, and migration costs as you introduce new hardware, software, and protocols into the network. With a comprehensive lifecycle of services, Cisco experts will help you minimize disruption and improve operational efficiency to extract maximum value from your Cisco DNA-ready infrastructure.

Cisco Capital

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

Smart Account

Creating Smart Accounts by using the Cisco Smart Software Manager (SSM) enables you to order devices and licensing packages and also manage your software licenses from a centralized website. For more information on Smart Accounts, refer to https://www.cisco.com/go/smartaccounts.

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 https://www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: https://www.cisco.com/go/trademarks. Third party trademarks mentioned 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. (1110R)

Printed in USA C78-742699-15 09/21

© 2021 Cisco and/or its affiliates. All rights reserved.

14
Telelex

Cisco Catalyst 9200 Series Switches

Contents

Extend intent-based networking everywhere

Cisco® Catalyst 9200 Series switches extend the power of intent-based networking and Catalyst 9000 hardware and software innovation to a broader set of deployments. With its family pedigree, Catalyst 9200 Series switches offer a way to activate core premise with secure, always-on, and IT simplified.

As foundational building blocks for the Cisco Digital Network Architecture, Catalyst 9200 Series switches help customers simplify complexity, optimize IT, and reduce operational costs by leveraging intelligence, automation and human expertise that no other vendor can deliver regardless of where you are in the intent-based networking journey.

Catalyst 9200 Series switches provide security features that protect the integrity of the hardware as well as the software and all data that flows through the switch. It provides real-time visibility that keeps your business up and running even more. Combine that with open APIs of Cisco IOS XE and programmability of the UADP ASIC technology, Catalyst 9200 Series switches give you what you need now with investment protection as future innovations.

With full PoE+ capability, power and fan redundancy, stacking bandwidth up to 160 Gbps, modular uplinks, Layer 3 feature support, and solid positioning, Catalyst 9200 Series switches are the industry's value-added solution with differentiated resiliency and progressive architecture for cost-effective branch-office access.

Product overview

Product highlights

- Up to 48 ports of full Power over Ethernet Plus (PoE+) capability
- Resiliency with Field-Replaceable Units (FRU) and redundant power supply, fans, and modular uplinks
- Flexible downlink options with data, PoE+, or mGig
- Operational efficiency with optional backplane stacking, supporting stacking bandwidth up to 160 Gbps
- UADP 2.0 Mini with integrated CPU where customers optimized scale with better cost structure
- Enhanced security with AES-128 MACSec encryption, policy-based segmentation, and trustworthy systems
- Layer 3 capabilities, including OSPF, EIGRP, IS-IS, RIP, and routed access
- Advanced network monitoring using full Flexible NetFlow
- Cisco Software-Defined Access (SD-Access)
  - Simplified operations and deployment with policy-based automation from edge to cloud managed with Cisco DNA Center™ Essentials and Advantage
  - Network assurance and improved resolution time through Cisco DNA Center
- Plug and Play (PnP) enabled: A simple, secure, unified, and integrated offering to scale from branch or campus device rollouts or upgrades to an existing network

- Cisco IOS XE: A Common Licensing-based operating system for the enterprise Cisco Catalyst 9000 product family with support for model-driven programmability and streaming telemetry
- ASIC with programmable pipeline and micro-engine capabilities, along with template-based, configurable allocation of Layer 2 and Layer 3 forwarding, Access Control Lists (ACLs), and Quality of Service (QoS) entries

Features and benefits

Platform details

Switch models and configurations

Model	Uplink ports	PoE+ ports	Modular uplinks	Stacking Bandwidth (Gbps)	IP Services Support
Modular uplink models (C9200 Advantage/Essentials)		✓	✓	160 Gbps	Yes (32 virtual networks)
Modular uplink models (C9200 SKUs)	✓	✓	✓	160 Gbps	Yes (4 Virtual Networks)
Fixed uplink models (C9200L SKUs)	✓	✓	✓	80 Gbps	Limited (1 Virtual Network)

The Cisco Catalyst 9200 Series is made up of modular (C9300) and fixed (C9200L) switch models.

Figure 1.
Cisco Catalyst 9200 Series switches

Table 1. Cisco Catalyst 9200 Series fixed configurations

Switch model	Uplink ports	Stacking	Default power supply	Fans
Modular uplink models				
C9200-24T	24 ports data	Modular uplink options	PWR-C5-125WAC	FRU redundant
C9200-24P	24 ports full PoE+	Modular uplink options	PWR-C5-600WAC	FRU redundant
C9200-24PB	24 ports full PoE+	Modular uplink options	PWR-C5-600WAC	FRU redundant
C9200-24PXG	24 ports full PoE+ (8 mGig ports up to 10G, 16 ports up to 1G)	Modular uplink options	PWR-C5-600WAC	FRU redundant
C9200-48T	48 ports data	Modular uplink options	PWR-C5-125WAC	FRU redundant
C9200-48P	48 ports full PoE+	Modular uplink options	PWR-C5-715WAC	FRU redundant
C9200-48PL	48 Ports better PoE+	Modular uplink options	PWR-C5-600WAC	FRU redundant
C9200-48PB	48 ports full PoE+	Modular uplink options	PWR-C5-715WAC	FRU redundant
C9200-48PXG	48 ports full PoE+ (8 mGig ports up to 10G, 40 ports up to 1G)	Modular uplink options	PWR-C5-715WAC	FRU redundant
Fixed uplink models				
C9200L-24T-4G	24 ports data	4x 1G fixed uplinks	PWR-C5-125WAC	Fixed redundant
C9200L-24P-4G	24 ports full PoE+	4x 1G fixed uplinks	PWR-C5-600WAC	Fixed redundant
C9200L-48T-4G	48 ports data	4x 1G fixed uplinks	PWR-C5-125WAC	Fixed redundant
C9200L-48P-4G	48 ports full PoE+	4x 1G fixed uplinks	PWR-C5-715WAC	Fixed redundant
C9200L-48PL-4G	48 Ports better PoE+	4x 1G fixed uplinks	PWR-C5-600WAC	Fixed redundant
C9200L-24PXG-2Y	24 ports full PoE+ (8 mGig ports up to 10G, 16 ports up to 1G)	2x 1/10/25G fixed uplinks	PWR-C5-715WAC	Fixed redundant
C9200L-48PXG-4X	48 ports full PoE+ (12 mGig ports up to 10G, 36 ports up to 1G)	4x 1/10G fixed uplinks	PWR-C5-1KWAC	Fixed redundant
C9200L-24PXG-2Y	24 ports full PoE+ (8 mGig ports up to 10G, 16 ports up to 1G)	2x 1/10/25G fixed uplinks	PWR-C5-600WAC	Fixed redundant

Switch model	Description
C9200L-48PXG-2Y	48 ports full POE+ (8 mGig ports up to 10G, 40 ports up to 1G) 2x 1/10/25G fixed uplinks PWR-C5-1KWAC Fixed redundant

Network modules

Cisco Catalyst 9200 Series switches come with modular or fixed uplinks as noted in Table 1. With modular uplinks, the switch supports network modules to provide flexible uplink investment protection by allowing a nondisruptive migration from 1 Gbps, 10G, and beyond. When you purchase the switch, you can choose from the network modules described in Table 2.

Figure 2.
Cisco Catalyst 9200 Series fixed uplink network modules

Table 2. Fixed uplink modules and numbers and descriptions

Network module	Description
C9200-NM-2Y=	2 x 25G Network Module
C9200-NM-2Q=	2 x 40G Network Module
C9200-NM-4G=	4 x 1G Network module
C9200-NM-4X	4x 1G/10G network module
C9200-NM-BLANK	Pre-fabricated blank

For additional details, please read our FAQ.

https://www.cisco.com/c/dam/en/us/products/collateral/switches/catalyst-9300/nb-06-cat9k-ser-faq-cte-en.pdf

Platform resiliency

Power supplies

Cisco Catalyst 9200 Series switches support dual hot-swappable power supplies (Figure 3). Each switch ships with one default power supply, and a second internal power supply can be purchased with the initial order or can be added at a later time. The second power supply can provide redundancy or additional power to PoE+ ports as needed.

Intelligent PoE+

- IEEE 802.3at PoE+ (up to 30W per port) is supported on Cisco Catalyst 9200 Series switches to boost the total cost of ownership for deployments that incorporate Cisco IP phones, Cisco Aironet® wireless access points, or other standards-compliant PoE+ end devices. PoE+ removes the need to supply wall power to PoE-enabled devices and eliminates the cost of adding electrical cabling and conduits that would otherwise be necessary in IP phone and WLAN deployments. With Cisco Catalyst 9200 Series switches, PoE+ power allocation is dynamic, and power mapping scales up to a maximum of 740W of PoE+ power.
- **Perpetual PoE** is supported on Cisco Catalyst 9200 Series switches, and maintains the PoE power during a switch reload. This is important for critical endpoints such as medical devices and for Internet of Things (IoT) endpoints such as PoE-powered lights, so that there is no disruption during a switch reload.
- **Fast PoE:** When power is restored to a switch, Fast PoE starts delivering power to endpoints without waiting for the operating system to fully load, thereby speeding up the time for the endpoint to start up.

Figure 3.
Cisco Catalyst 9200 Series fixed-port switch with redundant power supplies

Table 2 lists the PoE+ power availability for each model.

Table 2. PoE+ Power with primary and secondary power supplies

Model	Default power supply (power supply 1)	Available PoE power with single primary power supply (PS1)	Optional secondary power supply (power supply 2)	Available PoE power with primary and secondary power supplies
C9200-24P	PWR-C5-600WAC	370W	PWR-C5-600WAC	740W
C9200-24PB	PWR-C5-600WA/2	370W	PWR-C5-600WAC	740W
C9200-24PXG	PWR-C5-600WA/2	370W	PWR-C5-600WAC	740W
C9200-48P	PWR-C5-1KWAC	740W	PWR-125-1KWAC	1440W
C9200-48PL	PWR-C5-600WAC	370W	PWR-C5-600WAC	740W
C9200-48PB	PWR-C5-1KWAC	740W	PWR-C5-1KWAC	1440W
C9200-48PXG	PWR-C5-1KWAC	740W	PWR-C5-1KWAC	1440W
C9200L-24P-4G	PWR-C5-600WAC	370W	PWR-C5-600WAC	740W
C9200L-24P-4X	PWR-C5-600WAC	370W	PWR-C5-600WAC	740W
C9200L-48P-4G	PWR-C5-1KWAC	740W	PWR-C5-1KWAC	1440W
C9200L-48PL-4G	PWR-C5-600WAC	370W	PWR-C5-600WAC	740W
C9200L-48P-4X	PWR-C5-1KWAC	740W	PWR-C5-1KWAC	1440W
C9200L-48PL-4X	PWR-C5-600WAC	370W	PWR-C5-600WAC	740W
C9200L-24PXG-4X	PWR-C5-600WAC	370W	PWR-C5-600WAC	740W
C9200L-48PXG-4X	PWR-C5-1KWAC	740W	PWR-C5-1KWAC	1440W

Model	Default power supply (power supply 1)	Available PoE power with single primary power supply (PS1)	Optional secondary power supply (power supply 2)	Available PoE power with primary and secondary power supplies
C9200L-24P-2Y	PWR-C5-600WAC	370W	PWR-C5-600WAC	740W
C9200L-48P-2Y	PWR-C5-1KWAC	740W	PWR-C5-1KWAC	1440W

Stacking

Cisco Catalyst 9200 Series switch models are designed for stacking switches as a single virtual switch, enabling customers to have a simple management plane and control plane for up to 384 access ports.

Table 4 lists the supported stacking options.

Table 4. Supported stacking options

Model	Stacking type	Stacking bandwidth (per switch)	Hardware required	Number of switches	Supported switch combinations
Modular models (C9300 SKUs)	StackWise-160	160 Gbps	C9200-STACK-KIT	8	Other C9200 models with same license level
Fixed models (C9300L SKUs)	StackWise-80	80 Gbps	C9200L-STACK-KIT	8	Other C9200L models with same license level

Mixed stacking is not supported. You cannot mix a fixed C9200L SKU (48 network IO C9200 SKUs) models, or other Catalyst switches, e.g. Cisco Catalyst 2960-X and 2960-XR family.

The optional StackWise-160 and Stack Power (SP) is a part of two additional stacking cable. The default stacking cable is 0.5 m, but options of 1 m and 3 m are also available. Table 5 lists the stacking accessories.

Table 5. Stacking accessories

Model	Description
C9200-STACK-KIT	Stack kit for C9200 SKUs only. Two data stack modules and one data stack cable
C9200L-STACK-KIT	Stack kit for C9200L SKUs only. Two data stack modules and one data stack cable
STACK-T2-50CM	Data stack 50 cm cable (default value with Stack Kit)
STACK-T2-1M	Data stack 1 m cable
STACK-T2-3M	Data stack 3 m cable

Figure 4.
Cisco Catalyst 9200 Series fixed-port stacked units

Fans

Cisco Catalyst 9200 Series switches also come with dual fans and support redundancy. Cisco Catalyst 9200 Series switches support redundancy with dual fans. On the C9200 SKUs, the fan units are field-replaceable, while dual on the Fixed C9200L SKUs, the fan units are Fixed. Table 6 lists the fan module part number.

Table 6. Fan modules

Model	Description
C9200-FANH	Fan module

Performance and scalability

Table 7 lists performance and scalability metrics for Cisco Catalyst 9200 Series switches. Table 8 lists the bandwidth specifications.

Table 7. Performance specifications

Description	C9200-24P / C9200-24T / C9200-24PB / C9200-24PXG / C9200-48P / C9200-48T / C9200-48PB / C9200-48PXG / C9200L-24P-4G / C9200L-24T-4G / C9200L-48P-4G / C9200L-48T-4G / C9200L-24P-4X / C9200L-24T-4X / C9200L-48P-4X / C9200L-48T-4X / C9200L-24PXG-4X / C9200L-48PXG-4X / C9200L-24P-2Y / C9200L-48P-2Y / C9200L-24PXG-2Y / C9200L-48PXG-2Y	C9200-48PL / C9200L-48PL-4G / C9200L-48PL-4X / C9200L-48PXG-4X
Virtual Networks	A No. C9200 (24T, C9200-24P, C9200-24T, C9200-24PB, C9200-24PXG, C9200-48P, C9200-48T, C9200-48PB, C9200-48PXG, C9200L-24P-4G, C9200L-24T-4G, C9200L-48P-4G, C9200L-48T-4G, C9200L-24P-4X, C9200L-24T-4X, C9200L-48P-4X, C9200L-48T-4X, C9200L-24PXG-4X, C9200L-48PXG-4X, C9200L-24P-2Y, C9200L-48P-2Y, C9200L-24PXG-2Y, C9200L-48PXG-2Y) 32 No. C9200-24PB, C9200-48PB	1
Stacking bandwidth	160 Gbps	80 Gbps
Total number of MAC addresses	32,000	16,000
Total number of IPv4 routes (ARP plus learned routes)	16,000 (12,000 direct routes and 4,000 indirect routes)	11,000 (8,000 direct routes and 3,000 indirect routes)
IPv4 routing entries	4,000	3,000

Description	C9200-24P / C9200-24T / C9200-24PB / C9200-24PXG / C9200-48P / C9200-48T / C9200-48PB / C9200-48PXG / C9200L-24P-4G / C9200L-24T-4G / C9200L-48P-4G / C9200L-48T-4G / C9200L-24P-4X / C9200L-24T-4X / C9200L-48P-4X / C9200L-48T-4X / C9200L-24PXG-4X / C9200L-48PXG-4X / C9200L-24P-2Y / C9200L-48P-2Y / C9200L-24PXG-2Y / C9200L-48PXG-2Y	C9200-48PL / C9200L-48PL-4G / C9200L-48PL-4X / C9200L-48PXG-4X
IPv6 routing entries	2,000	1,000
Multicast routing scale	1,000	1,000
QoS scale entries	1,000	1,000
ACL scale entries	1,000	1,000
Packet buffer per SKU	6 MB in Ports for 24- or 48-port Gigabit Ethernet models; 12MB buffers for 24- or 48-port multigigabit models	6 MB buffers for 24- or 48-port Gigabit Ethernet models; 12 MB buffers for 24- or 48-port multigigabit models
Random Port Scan (RPS) entries	16,000 Routes on 24- and 48-port Gigabit Ethernet models	16,000 Routes on 24- and 48-port Gigabit Ethernet models; 24 RPS lines on 24-or 48-port multigigabit models
DRAM	4 GB	2 GB
Flash	4 GB	4 GB
VLAN IDs	4096	4094
FHRP instances	128	128
STP Virtual Ports (Port * VLANs) for PVST	13,824	13,000
STP Virtual Ports (Port * VLANs) for MST	13,824	13,000
Total Switched Virtual Interfaces (SVIs)	1000	512
Jumbo frames	9198 bytes	9198 bytes
Wireless bandwidth per switch	Up to 40 Gbps on 24-port and 48-port Gigabit Ethernet model	N/A
IP MAC binding scale	8k	16k
Number of IPv4 bindings	8k	16k
Number of NETCONF sessions	24	24
Number of YANG Sessions	200	200

Table 8. Bandwidth specifications

Description	Switching capacity	Forwarding rate with 64-byte packets	Forwarding rate with IMIX packets
C9200-24P	128 Gbps	190 Mpps	95.23 Mpps	214 Mpps
C9200-24T	128 Gbps	190 Mpps	95.23 Mpps	214 Mpps
C9200-24PB	128 Gbps	190 Mpps	95.23 Mpps	214 Mpps
C9200-24PXG	202 Gbps	632 Mpps	241.00 Mpps	329 Mpps
C9200-48P	176 Gbps	336 Mpps	130.95 Mpps	250 Mpps
C9200-48T	176 Gbps	336 Mpps	130.95 Mpps	250 Mpps
C9200-48PL	176 Gbps	336 Mpps	130.95 Mpps	250 Mpps
C9200-48PB	176 Gbps	336 Mpps	130.95 Mpps	250 Mpps
C9200-48PXG	490 Gbps	568 Mpps	241.91 Mpps	431 Mpps
C9200L-24T-4G	88 Gbps	138 Mpps	41.00 Mpps	101 Mpps
C9200L-24P-4G	88 Gbps	138 Mpps	41.00 Mpps	101 Mpps
C9200L-48T-4G	164 Gbps	164 Mpps	77.38 Mpps	137 Mpps
C9200L-48P-4G	164 Gbps	164 Mpps	77.38 Mpps	137 Mpps
C9200L-48PL-4G	164 Gbps	164 Mpps	77.38 Mpps	137 Mpps
C9200L-24T-4X	128 Gbps	164 Mpps	95.23 Mpps	155 Mpps
C9200L-24P-4X	128 Gbps	164 Mpps	95.23 Mpps	155 Mpps
C9200L-48T-4X	176 Gbps	256 Mpps	130.95 Mpps	188 Mpps
C9200L-48P-4X	176 Gbps	256 Mpps	130.95 Mpps	188 Mpps
C9200L-48PL-4X	176 Gbps	256 Mpps	130.95 Mpps	188 Mpps
C9200L-24PXG-4X	272 Gbps	352 Mpps	214.28 Mpps	342 Mpps
C9200L-24PXG-2Y	292 Gbps	472 Mpps	229.16 Mpps	377 Mpps
C9200L-48PXG-4X	392 Gbps	472 Mpps	291.66 Mpps	481 Mpps
C9200L-48PXG-2Y	340 Gbps	420 Mpps	252.97 Mpps	213 Mpps

Measured with 64-byte packets

Software

Platform software benefits

Cisco IOS XE

Cisco IOS XE Software opens a completely new paradigm in network configuration, operation, and monitoring through network automation. Cisco's automation solution is open, standards-based, and extensible across the entire lifecycle of a network device. The various automation mechanisms are outlined below.

- **Automated device provisioning** is the ability to automate the process of upgrading software images and installing configuration files on Cisco Catalyst switches when they are being deployed in the network for the first time. Cisco provides turnkey solutions such as Plug and Play and Preboot Execution Environment (PXE) that enable an effortless and automated deployment.
- **API-driven configuration** is available with modern network switches such as Cisco Catalyst 9200 Series switches. It supports a wide range of automation features and provides robust open APIs over NETCONF and RESTCONF using YANG data models for external tools, both off the shelf and custom built, to automatically provision network resources.
- **Granular visibility** enables model-driven telemetry to stream data from a switch to a destination. The data to be streamed is identified through subscription to a data set in a YANG model. The subscribed data set is streamed to the destination at specified intervals. Additionally, Cisco IOS XE enables the push model. It provides near-real-time monitoring of the network, leading to quick detection and rectification of failures.
- **Seamless software upgrades and patching** supports OS resilience. On Cisco Catalyst 9200 Series switches Cisco IOS XE supports cold patching with reboot, which provides fixes for critical bugs and security vulnerabilities between regular maintenance releases. This support lets you add patches without having to wait for the next maintenance release. Cold patching requires the switch to be rebooted after patching to allow the changes to take effect.
- **Trustworthy solutions built with Cisco Trust Anchor Technologies** provide a highly secure foundation for Cisco products. With Cisco Catalyst 9200 Series switches, these technologies enable hardware and software authenticity assurance for supply chain trust and strong mitigation against man-in-the-middle attacks that compromise software and firmware. Trust Anchor capabilities include image signing, Secure Boot, and Cisco Trust Anchor module.
- **High availability:** Cisco Catalyst 9200 Series switches support high-availability features, including the following:
  - Cross-stack EtherChannel provides the ability to configure Cisco EtherChannel technology across different members of the stack for high resiliency.
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) provides rapid spanning tree convergence independent of spanning tree timers and also offers the benefit of Layer 2 load balancing and distributed processing.
  - Per-VLAN Rapid Spanning Tree (PVRST+) allows rapid spanning tree (IEEE 802.1w) reconvergence on a per-VLAN spanning tree basis, providing simpler configuration than MSTP. In both MSTP and PVRST+ modes, stacked units behave as a single spanning tree node.
  - Switch-port auto-recovery ("err-disable" recovery) automatically attempts to reactivate a link that is disabled because of a network error.

- The Catalyst 9200 Series platform delivers the best 50.0 redundancy architecture in a stackable solution with sub-50-ms failover.

The Foundation of Software-Defined Access

Secure Segmentation with SD-Access

The enterprise network lies at the heart of digital transformation. A network that is open, programmable, integrated, and secure maximizes business agility, allowing new business opportunities to be pursued and captured.

Cisco DNA with SD-Access is the network fabric that powers business. It is an open and extensible software-driven architecture that accelerates and simplifies your enterprise network operations. The programmable architecture frees your IT staff from time-consuming, repetitive network configuration tasks so they can focus instead on innovation that positively transforms your business. SD-Access enables policy-based automation from edge to cloud with foundational capabilities. These include:

- Simplified device deployment
- Unified management of wired and wireless networks
- Network virtualization and segmentation
- Group-based policies
- Context-based analytics
- SD-Access: Cisco Catalyst 9200 Series switches are the entry-level devices for SD-Access, Cisco's lead enterprise architecture, with policy-based automation from edge to cloud.
  - Simplified segmentation and micro-segmentation, with predictable performance and scalability
  - Automation through Cisco DNA Center
  - Policy handled through the Cisco Identity Services Engine (ISE)
  - Faster launch of new business services and significantly improved issue resolution time
- Assurance
  - Full network visibility and monitoring
  - End-to-end Quality of Experience (QoE)
  - Fast issue resolution and network remediation
- Plug and Play (PnP) enabled: A simple, secure, unified, and integrated offering to ease new branch or campus device rollouts or updates to an existing network.

Cloud Security

- **Umbrella integration:**

  Small to midsize networks reliant on managed service providers can now host Cisco Umbrella agent directly on their Catalyst 9200 series switches. This allows the business to easily customize their DNS filtering policies to prevent BYOD or IoT guest or corporate users from accessing malicious or inappropriate websites, without having to rely on the MSP to push the policies out. It also lets them optimize use of bandwidth by allowing direct cloud access for trusted apps. Requires DNA-Advantage License and Umbrella License per device.

Full Flexible NetFlow

- **Full Flexible NetFlow (FNF):** Cisco IOS FNF is the next generation in flow visibility technology. It enables optimization of the network infrastructure, reduces operation costs, and improves capacity planning and security incident detection with increased flexibility and scalability. Catalyst 9200 Series switches are capable of up to 16,000 flow entries on 48-port and 24-port models.

QoS

- **Superior QoS:** Cisco Catalyst 9200 Series switches offer Gigabit Ethernet speeds with intelligent services that keep traffic flowing smoothly, even at 10 times the normal network speed. Industry-leading mechanisms for cross-class marking, classification, and scheduling deliver superior performance for data, voice, and video traffic at wire speed. Superior QoS includes granular wireless bandwidth management and fair sharing, 802.1p Class of Service (CoS) and Differentiated Services Code Point (DSCP) field classification, Shaped Round Robin (SRR) scheduling, Committed Information Rate (CIR), and eight egress queues per port.

Smart operation

- **WebUI:**

  WebUI is an embedded GUI-based device-management tool that provides the ability to provision the device, to simplify device deployment and manageability, and to enhance the user experience. It comes with the default image, so there is no need to enable anything or install any license on the device. You can use WebUI to build configurations, and to monitor and troubleshoot the device without having CLI expertise.
- **RFID tags:**

  Cisco Catalyst 9200 Series switches have an embedded RFID tag that facilitates easy asset and inventory management using commercial RFID readers.
- **Blue beacon:**

  Cisco Catalyst 9200 Series switches support both front and back blue beacon LEDs for easy identification of the switch being accessed.

- **Efficient switch operation:**

  Cisco Catalyst 9200 Series switches provide optimum power saving with Energy Efficient Ethernet (EEE) on the RJ-45 ports and low-power operations for industry best-in-class power management and power consumption capabilities. The ports support reduced power modes so that ports not in use can move into a lower power utilization state. Other efficient switch operation features are as follows:
  - Per-port power consumption command allows customers to specify a maximum power setting on an individual port.
  - Per-port PoE power sensing measures actual power being drawn, enabling more intelligent control of powered devices. The PoE MIB provides proactive visibility into power usage and allows you to set different power-level thresholds.
- **Bluetooth ready:**

  Cisco Catalyst 9200 Series switches have hardware support to connect a Bluetooth dongle to your switch, enabling you to use this wireless interface as an IP management port interface. The port can be used for configuration and troubleshooting using WebUI or the Command-Line Interface (CLI), and to transfer images and configurations.

High-performance IP routing

The Cisco Express Forwarding hardware routing architecture delivers extremely high-performance IP routing in Cisco Catalyst 9200 Series switches, based on:

- IP unicast routing protocols (including static, Routing Information Protocol Version 1 [RIPv1], RIPv2, RIPng, and Open Shortest Path First [OSPF] Routed Access) are supported for small network routing applications with the Network Essentials stack. Equal-cost routing facilitates Layer 3 load balancing and redundancy across the stack.
- Advanced IP unicast routing protocols (including full [OSPF], Enhanced Interior Gateway Routing Protocol [EIGRP], and Intermediate System-to-Intermediate System Version 4 [IS-ISv4]) are supported for load balancing and for constructing scalable LANs. IPv6 routing (using OSPFv3 and EIGRPv6) is supported in hardware for maximum performance.
- Protocol-Independent Multicast (PIM) for IP multicast routing is supported, including PIM sparse mode (PIM-SM), and Source-Specific Multicast (SSM).
- IPv6 addressing is supported on interfaces with appropriate show commands for monitoring and troubleshooting.

Licensing

Packaging: Network and Cisco DNA licensing

The Cisco Catalyst 9000 family of switches introduces a new and simplified licensing package in the form of base and add-on licenses.

- **The perpetual licensing package** includes the Network Essentials and Network Advantage licensing options that are tied to the hardware. Between them, the base licensing packages cover switching fundamentals, management automation, troubleshooting, and advanced switching features. These Network licenses are perpetual.
- **The subscription licensing package** includes the Cisco DNA Essentials and Cisco DNA Advantage options. In addition to on-box capabilities, the features available with this package provide Cisco innovations on the switch, as well as on Cisco DNA Center. The Cisco DNA subscription licenses are mandatory at the time of configuration. With Cisco DNA software licenses, customers receive embedded SWSS – which covers 24x7x365 Cisco Technical Assistance Center (TAC) support, software release updates, advanced support analytics, and designated service management. This is valid only for the Cisco DNA software subscription stacks (Cisco DNA Essentials, Advantage, and Premier).

Note: For full hardware support, including the perpetual network stack customers will require Smart Net Total Care for 24x7x365 Cisco Technical Assistance Center (TAC) support, proactive security and product alerts, and product lifecycle management. An additional option for hardware support is Solution Support for your multivendor Cisco solution environment.

License consumption is easily determined by the package itself. While perpetual licenses are always permanent (and without an expiration date), subscription licenses have to be purchased for a 3-, 5-, or 7-year term (and hence are also known as term-based licenses). Table 12 shows the combinations of perpetual and subscription licenses that must be purchased.

Supported licensing combinations

Table 5. Licensing combinations

	Cisco DNA Premier	Cisco DNA Advantage	Cisco DNA Essentials
Network Essentials	No	No	Yes
Network Advantage	Yes	Yes	No

[illegible] the Cisco DNA [illegible] used with Network Advantage.

Cisco DNA Premier subscription

Cisco DNA Premier subscriptions offer a flexible way to buy software for the access, WAN, and data center domains. At each stage in the product lifecycle, Cisco DNA Premier subscriptions help make buying, managing, and upgrading your network and infrastructure software easier. Cisco DNA Premier subscriptions provide:

- Flexible licensing models to smoothly distribute customers' software spending over time
- Investment protection for software purchases through software services-enabled license portability
- Lower cost of entry with the new Cisco DNA Premier Subscription for Switching model

For ordering information for Cisco DNA Premier Software for Cisco Catalyst 9200 Series switches, go to: [illegible]

Cisco Catalyst 9200 Series switches run on Cisco IOS XE Release 16.9.2 or later. This software release includes all the features listed earlier in the Platform Software Benefits section.

Managing licenses with Smart Accounts: Creating Smart Accounts by using the Cisco Smart Software Manager (Cisco SSM) enables you to order devices and licensing packages and also manage your software licenses from a centralized website. You can set up Cisco SSM to receive daily email alerts and to be notified of expiring add-on licenses that you want to renew.

You must order an add-on license in order to purchase a switch. When the license term expires, you can either renew the add-on license to continue using it or deactivate the add-on license and then reload the switch to continue operating with the base license capabilities.

Both the base and add-on licenses are also available for a 90-day evaluation period. An evaluation license is activated temporarily, without purchase. An expired evaluation license cannot be reactivated after reload.

Note: It is not required to deploy Cisco DNA Center, just to use one of the above packages.

Table 10 shows the features included in the Network Essentials and Advantage packages.

Table 11 shows the features included in the Cisco DNA Essentials and Advantage packages.

Network licensing

Table 10. Network essentials and advantage package features

Features on Cisco Catalyst 9200 Series switches	Network Essentials	Network Advantage
Switch fundamentals Layer 2, Routed Access (RIP, EIGRP Stub, OSPF – 1000 routes), PBR, PIM Stub Multicast (1000 routes), PVLAN, VRRP, PBR, CDP, QoS, FHS, 802.1X, MACsec-128, CoPP, SXP, IP SLA Responder, SSO	✓	✓
Advanced switch capabilities and scale EIGRP, HSRP, IS-IS, BSR, MSDP, IP SLA, OSPF	x	✓
Network segmentation VRF, VXLAN, LISP, SGT	x	✓

Features on Cisco Catalyst 9200 switches	Network Essentials	Network Advantage
Automation NETCONF, RESTCONF, YANG, PnP Agent, PnP	✓	✓
Telemetry and visibility Model-driven telemetry, sampled NetFlow, SPAN, RSPAN	✓	✓
Security MACsec-128	✓	✓

Cisco DNA licensing

Table 11. Cisco DNA Essentials, Advantage, and Premier Package Features

Features	Cisco DNA Essentials	Cisco DNA Advantage	Cisco DNA Premier
Switch features			
Advanced telemetry and visibility Full Flexible NetFlow, EEM	✓	✓	✓
Optimized telemetry and visibility AVC (NBAR2)	✗	✓	✓
Cisco DNA Center features			
Day-0 network bring-up automation Cisco Network Plug-and-Play application, network settings, device credentials, LAN automation, host onboarding	✓	✓	✓
Element management Discovery, inventory, topology, software image, licensing, and configuration management	✓	✓	✓
Element management Patch management	✗	✓	✓
Basic Assurance Health dashboards – Network, Client, Application; switch and wired client health monitoring	✓	✓	✓
SD-Access Policy-based automation and assurance for wired and wireless	✗	✓	✓
Network assurance and analytics Global insights, trends, compliance, custom reports, switch 360, wired client 360, fabric and non-fabric insights, app health, app 360, app performance (loss, latency, jitter)	✗	✓	✓
Other Software Included (can be purchased separately)			
ISE Base	✗	✗	✓
ISE Plus	✗	✗	✓

Features	Cisco DNA Essentials	Cisco DNA Advantage	Cisco DNA Premier
Stealthwatch	✗	✗	✓

Product sustainability

Refer to the CSR (Corporate Social Responsibility) section for more information on Cisco's environmental sustainability policies and initiatives.

Sustainability topic		Reference
General	Information on product material content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries, and packaging	WEEE Compliance
	Sustainability inquiries	Contact: csr_inquiries@cisco.com
	Safety and compliance	Table 17. Safety and compliance information
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
Power	IEEE 802.3at PoE+	Intelligent PoE+ Section
	PoE+ power availability	Table 5. PoE+ Power with Primary and secondary power supplies
	Fan	Fan Section
	Power connectors	Table 13. Connectors
	Power supply specifications	Table 15. Power supply specifications
	Power consumption (ATIS)	Table 16. Power consumption of Cisco Catalyst 9200 Series switches
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Chassis Dimension, weight, MTBF	Table 12. Model Dimensions, Weight, and Mean time between failures metrics
	Elimination of wet paint on plastic frame	2018 Cisco Corporate Social Responsibility Report Pg. 78 (Stepping up our work on plastics)

Specifications

Dimensions, Weight, Acoustic, Mean time between failures

Table 12 shows the dimensions, weights, acoustic, and mean time between failures of all models of Cisco Catalyst 9200 Series switches.

Table 12. Model Dimensions, Weight, and Mean time between failures metrics

Model	Chassis Dimensions (Inches)	Chassis Dimensions (Centimeters)	Chassis + FRU + Fan Dimensions (Inches)	Chassis + FRU + Fan Dimensions (Centimeters)
C9200-24T	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200-24P	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200-24PB	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200-24PXG	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200-48T	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200-48P	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200-48PL	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200-48PB	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200-48PXG	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200L-24T-4G	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-24P-4G	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-48T-4G	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-48P-4G	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-48PL-4G	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-24T-4X	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-24P-4X	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-48T-4X	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-48P-4X	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-48PL-4X	1.73 x 17.5 x 11.3	4.4 x 44.5 x 28.8	1.73 x 17.5 x 12.9	4.4 x 44.5 x 32.9
C9200L-24PXG-4X	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200L-24PXG-2Y	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200L-48PXG-4X	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1
C9200L-48PXG-2Y	1.73 x 17.5 x 13.8	4.4 x 44.5 x 35.0	1.73 x 17.5 x 15.4	4.4 x 44.5 x 39.1

Model	Pounds	Kilograms
C9200-24T	11.02	5.0
C9200-24P	12.12	5.5
C9200-24PB	12.12	5.5
C9200-24PXG	11.33	5.1
C9200-48T	11.02	5.0
C9200-48P	12.12	5.5
C9200-48PL	12.12	5.5
C9200-48PB	12.12	5.5
C9200-48PXG	11.98	5.45
C9200L-24T-4G	9.59	4.35
C9200L-24P-4G	10.38	4.71
C9200L-48T-4G	9.97	4.52
C9200L-48P-4G	10.58	4.80
C9200L-48PL-4G	10.58	4.80
C9200L-24T-4X	9.59	4.35
C9200L-24P-4X	10.38	4.71
C9200L-48T-4X	9.97	4.52
C9200L-48P-4X	10.58	4.80
C9200L-48PL-4X	10.58	4.80
C9200L-24PXG-4X	12	5.44
C9200L-24PXG-2Y	11	5.44
C9200L-48PXG-4X	12.8	5.71
C9200L-48PXG-2Y	12.8	5.71

Mean time between failures (hours)	
C9200-24T	547,800
C9200-24P	432,310
C9200-24PB	434,220
C9200-24PXG	353,950
C9200-48T	571,460
C9200-48P	375,870
C9200-48PL	375,870
C9200-48PB	344,980
C9200-48PXG	339,860
C9200L-24T-4G	531,030
C9200L-24P-4G	382,210
C9200L-48T-4G	555,730
C9200L-48P-4G	347,750
C9200L-48PL-4G	347,750
C9200L-24T-4X	515,890
C9200L-24P-4X	390,310
C9200L-48T-4X	503,490
C9200L-48P-4X	346,710
C9200L-48PL-4X	346,710
C9200L-24PXG-4X	379,410
C9200L-24PXG-2Y	374,730
C9200L-48PXG-4X	327,360
C9200L-48PXG-2Y	397,280
PWR-C5-125WAC	3,332,116
PWR-C5-600WAC	1,600,046
PWR-C5-1KWAC	1,600,046
PWR-C6-125WAC	3,332,116
PWR-C6-600WAC	1,600,046
PWR-C6-1KWAC	1,600,046

Environmental ranges	
Acoustic noise Measured per ISO 7779 and declared per ISO 9296 Bystander positions operating to an ambient temperature of 25°C	With AC power supply (with 24 PoE+ ports loaded) A-weighted sound pressure A-weighted sound power Typical: Noise emission for a typical configuration Maximum: Statistical maximum to account for variation in production

Connectors

Table 13 shows the supported connectors for Cisco Catalyst 9200 Series switches.

Table 13. Connectors

Connectors and cabling	[illegible]
Power connectors	[illegible]

For the latest Cisco transceiver module compatibility information, refer to https://www.cisco.com/c/en/us/td/docs/interfaces_modules/transceiver_modules/compatibility/matrix/7_GE_Tool_User_Manual.html

16

teletex IT solutions

Management and standards support

Table 14 shows management and standards support for Cisco Catalyst 9200 Series switches.

Table 14. Management and standards support

Description	Specification	
Management	BRIDGE-MIB	CISCO-NHRP-EXT-MIB
	CISCO-BRIDGE-EXT-MIB	CISCO-NTP-MIB
	CISCO-BULK-FILE-MIB	CISCO-PAGP-MIB
	CISCO-CABLE-DIAG-MIB	CISCO-PORT-SECURITY-MIB
	CISCO-CALLHOME-MIB	CISCO-PORT-STORM-CONTROL-MIB
	CISCO-CEF-MIB	CISCO-POWER-ETHERNET-EXT-MIB
	CISCO-CIRCUIT-INTERFACE-MIB	CISCO-PRIVATE-VLAN-MIB
	CISCO-CONFIG-COPY-MIB	CISCO-PROCESS-MIB
	CISCO-CONFIG-MAN-MIB	CISCO-PRODUCTS-MIB
	CISCO-DEVICE-LOCATION-MIB	CISCO-RF-MIB
	CISCO-DHCP-SNOOPING-MIB	CISCO-RTP-METRICS-MIB
	CISCO-[illegible]-MIB	CISCO-RTTMON-ICMP-MIB
	CISCO-EMBEDDED-EVENT-MGR-MIB	CISCO-STACKWISE-MIB
	CISCO-ENTITY-FRU-CONTROL-MIB	CISCO-STP-EXTENSIONS-MIB
	CISCO-ENTITY-SENSOR-MIB	CISCO-SYSLOG-MIB
	CISCO-ENTITY-VENDORTYPE-OID-MIB	CISCO-TCP-MIB
	CISCO-ERR-DISABLE-MIB	CISCO-UDLDP-MIB
	CISCO-FLASH-MIB	CISCO-VLAN-IFTABLE-RELATIONSHIP-MIB
	CISCO-FLOW-MONITOR-MIB	ENTITY-MIB
	CISCO-FTP-CLIENT-MIB	HC-ALARM-MIB
	CISCO-HSRP-EXT-MIB	HC-RMON-MIB
	CISCO-HSRP-MIB	IEEE8023-LAG-MIB
	CISCO-IETF-BFD-MIB	IF-MIB
	CISCO-IETF-PPVPN-MPLS-VPN-MIB	IP-FORWARD-MIB
	CISCO-IETF-PW-MPLS-MIB	IP-MIB
	CISCO-IF-EXTENSION-MIB	LLDP-EXT-MED-MIB
	CISCO-IGMP-FILTER-MIB	LLDP-MIB
	CISCO-IMAGE-LICENSE-MGMT-MIB	MAU-MIB
	CISCO-IMAGE-MIB	MPLS-L3VPN-STD-MIB
	CISCO-IP-CBR-METRICS-MIB	MPLS-LSR-STD-MIB
	CISCO-IP-STAT-MIB	MPLS-VPN-MIB
	CISCO-IP-TAP-MIB	OLD-CISCO-CHASSIS-MIB
	CISCO-IP-URPF-MIB	OLD-CISCO-CPU-MIB
	CISCO-IPSEC-FLOW-MONITOR-MIB	

© 2021 Cisco and/or its affiliates. All rights reserved.

Description	Specification	
	CISCO-IPSEC-MIB	OLD-CISCO-INTERFACES-MIB
	CISCO-IPSEC-PROVISIONING-MIB	OLD-CISCO-IP-MIB
	CISCO-IPSLA-AUTOMEASURE-MIB	OLD-CISCO-MEMORY-MIB
	CISCO-IPSLA-ECHO-MIB	OLD-CISCO-SYS-MIB
	CISCO-IPSLA-JITTER-MIB	OLD-CISCO-TCP-MIB
	CISCO-L2-CONTROL-MIB	OLD-CISCO-TS-MIB
	CISCO-L2L3-INTERFACE-CONFIG-MIB	POWER-ETHERNET-MIB
	CISCO-LAG-MIB	RFC1213-MIB
	CISCO-LICENSE-MGMT-MIB	RMON-MIB
	CISCO-LOCAL-AUTH-USER-MIB	RMON2-MIB
	CISCO-MAC-NOTIFICATION-MIB	SMON-MIB
	CISCO-MDI-METRICS-MIB	SNMPv2-MIB
	CISCO-MEDIA-METRICS-MIB	SONET-MIB
	CISCO-MEMORY-POOL-MIB	TCP-MIB
	CISCO-MPLS-LSR-EXT-STD-MIB	UDP-MIB
	CISCO-NBAR-PROTOCOL-DISCOVERY-MIB	
Standards	IEEE 802.1s	RMON I and II standards
	IEEE 802.1w	SNMPv1, v2c, and v3
	IEEE 802.1x	
	IEEE 802.1x-Rev	
	IEEE 802.3ad	
	IEEE 802.3af	
	IEEE 802.3at	
	IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports	
	IEEE 802.1D Spanning Tree Protocol	
	IEEE 802.1p CoS prioritization	
	IEEE 802.1Q VLAN	
	IEEE 802.3 10BASE-T specification	
	IEEE 802.3u 100BASE-TX specification	
	IEEE 802.3ab 1000BASE-T specification	
	IEEE 802.3z 1000BASE-X specification	
	IEEE 802.1AE – 128-bit AES MACsec (host-to-network) encryption with MACsec Key Agreement (MKA)	
	IEEE 802.3bz (for mGig PHD SKUs only)	
	IEEE 802.3an (10GBase-T) (for mGig PHD SKUs only)	

© 2021 Cisco and/or its affiliates. All rights reserved.

Power supply specifications

Table 15 lists the power specifications for Cisco Catalyst 9200 Series switches based on the kind of power supply used.

Table 15. Power supply specifications

Description	Specification					
	PWR-C5-125WAC	PWR-C6-125WAC	PWR-C5-600WAC	PWR-C6-600WAC	PWR-C5-1KWAC	PWR-C6-1KWAC
Power supply rated maximum	125W	125W	600W	600W	1000W	1000W
Total output BTU (Note: 1000 BTU/hr = 293W)	426.5 BTU/hr, 125W	426.5 BTU/hr, 125W	2047.3 BTU/hr, 600W	2047.3 BTU/hr, 600W	3412 BTU/hr, 1000W	3412 BTU/hr, 1000W
Input-voltage range and frequency	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz	100 to 240 VAC, 50 to 60 Hz
Input current	1.6-0.7A	1.6-0.7A	7-2.8A	7-2.8A	12-5A	12-5A
Output ratings	12V at 10.5A	12V at 10.5A	54V at 11.1A	54V at 11.1A	54V at 18.5A	54V at 18.5A
Output holdup time	20 ms minimum at 100 VAC	20 ms minimum at 100 VAC	20 ms minimum at 100 VAC	20 ms minimum at 100 VAC	20 ms minimum at 100 VAC	20 ms minimum at 100 VAC
Power-supply input receptacles	IEC 320-C14 (IEC60320-C14)	IEC 320-C14 (IEC60320-C14)	IEC 320-C16 (IEC60320-C16)	IEC 320-C16 (IEC60320-C16)	IEC 320-C16 (IEC60320-C16)	IEC 320-C16 (IEC60320-C16)
Power cord rating	10A	10A	15A	15A	15A	15A
Physical specifications	(H x W x D): [illegible]	(H x W x D): [illegible]	(H x W x D): [illegible]	(H x W x D): [illegible]	(H x W x D): [illegible]	(H x W x D): [illegible]
	Weight: 1.8 lb (0.82 kg)	Weight: 1.8 lb (0.82 kg)	Weight: 1.7 lb (0.77 kg)	Weight: 1.7 lb (0.77 kg)	Weight: 2 lb (0.9 kg)	Weight: 2 lb (0.9 kg)
Supported Product Family	C9200, C9200L	C9200	C9200, C9200L	C9200	C9200, C9200L	C9200

© 2021 Cisco and/or its affiliates. All rights reserved.

Description	Specification
Operating temperature	Normal operating temperature[1] and altitudes: • -5°C to +45°C, up to 5000 feet (1500m) • -5°C to +40°C, up to 10,000 feet (3000m) [1] Minimum ambient temperature for cold start is 32°F (0°C) Short-term[2] exceptional conditions: • -5°C to +50°C, up to 5000 feet (1500m) • -5°C to +45°C, up to 10,000 feet (3000m) • -5°C to +45°C, at sea level with single fan failure [2] Not more than following in one-year period: 96 consecutive hours, or 360 hours total, or 15 occurrences
Storage temperature	-40° to 158°F (-40° to 70°C)
Relative humidity operating and nonoperating noncondensing	5% to 90% noncondensing
Altitude	10,000 ft (3000 meters), up to 40°C
EMC compliance	FCC Part 15 (CFR 47) Class A ICES-003 Class A EN 55032 Class A CISPR 32 Class A AS/NZS 3548 Class A BSMI Class A VCCI Class A CISPR 35 EN 55035, EN300 386[3], EN61000-3-2, EN 61000-3-3
Safety compliance	UL 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1, IEC 60950-1, [illegible]
LED indications	"AC OK": Input power to the power supply is OK "PS OK": Output power from the power supply is OK

[illegible]

© 2021 Cisco and/or its affiliates. All rights reserved.

Power consumption of Standalone 9200 Series switches

Table 16 shows the power consumption of standalone Cisco Catalyst 9200 Series switches based on Alliance for Telecommunications Industry Solutions (ATIS) testing using Internet Mix (IMIX) distribution stream traffic, with input voltage of 115VAC at 60 Hz and no PoE loading. The values given are the maximum possible power consumption numbers under the respective test scenarios.

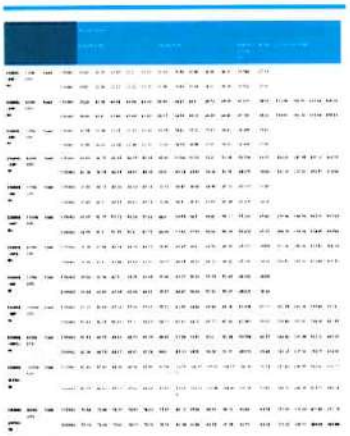
Table 16. Power consumption of Standalone Catalyst 9200 Series switches

[illegible]
[illegible]

© 2021 Cisco and/or its affiliates. All rights reserved.

[illegible]
[illegible]

© 2021 Cisco and/or its affiliates. All rights reserved.



Safety and compliance

Table 17 lists the safety and compliance information for Cisco Catalyst 9200 Series switches.

Table 17. Safety and compliance information

Description	Specifications
Safety certifications	• UL 60950-1 • CAN/CSA-C22.2 No. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • GB4943.1
Electromagnetic compatibility certifications	• 47 CFR Part 15 • ICES-003 Class A • VCCI Class A • EN 55032 Class A • CISPR 32 Class A • EN 55024 • CISPR 24 • EN300 386 • KN 32 Class A • KN 35 • TCVN 7189 Class A • VCCI Class A • CNS 13438 • AS/NZS • CNS 15936
Environmental	Reduction of Hazardous Substances (ROHS)

Warranty

Cisco enhanced limited lifetime hardware warranty

Cisco Catalyst 9200 Series switches come with a Cisco Enhanced Limited Lifetime Warranty (E-LLW) that includes next-business-day (NBD) delivery of replacement hardware where available and 90 days of 8x5 Cisco Technical Assistance Center (TAC) support.

Your formal warranty statement, including the warranty applicable to Cisco software, appears in the information packet that accompanies your Cisco product. We encourage you to review the warranty statement and consult your specific product carefully before use.

Cisco reserves the right to refund the purchaser the entire amount it receives in response to a warranty claim.

For further information about warranty terms, visit https://www.cisco.com/go/warranty. Table 18 provides information about the E-LLW.

Table 18. E-LLW details

Description	Specifications
Devices covered	Applies to Cisco Catalyst 9200 Series switches
Warranty duration	As long as the original customer owns the product
End-of-life policy	At the event of discontinuance of product manufacture, Cisco warranty support is limited to 5 years from the announcement of discontinuance.
Hardware replacement	Cisco or its service center will use commercially reasonable efforts to ship a replacement for NBD delivery, where available. Otherwise, a replacement will be shipped within 10 working days after receipt of the Return Materials Authorization (RMA) request. Actual delivery times might vary depending on customer location.
Effective date	Hardware warranty commences from the date of shipment to customer (and in case of resale by a Cisco reseller, not more than 90 days after original shipment by Cisco).
TAC support	Cisco will provide during business hours, 8 hours per day, 5 days per week, basic configuration, diagnosis, and troubleshooting of device-level problems for up to a 90-day period from the date of shipment of the originally purchased Cisco Catalyst 9200 Series product. This support does not include software or network-level support beyond basic problem determination.
Cisco.com access	Warranty shows open investments in Cisco.com

Cisco services for next-generation Cisco Catalyst switches

Achieve infrastructure excellence faster and with less risk. Cisco Catalyst 9000 Switch Services provide expert guidance to help you successfully deploy, manage and support the Cisco Catalyst 9000 switches. With unmatched networking expertise, best practices and innovative tools, we can help you reduce overall migration, refresh, and migration costs as you introduce new hardware, software and policies into the network. Offering a comprehensive lifecycle of services – from implementation, optimization, technical and managed services – Cisco experts help you minimize disruption and achieve operational excellence to extract maximum value from your Cisco DNA-ready infrastructure.

Learn more about Cisco Services for Enterprise Networks

Software Policy for Cisco Catalyst 9200 Series switches

Software Policy for Network Stack Components

Customers with the network Essentials Stack and Network Advantage Stack software feature sets are provided with maintenance updates and bug fixes designed to maintain compliance of the software. This includes compliance with published specifications, release notes, and industry standards as long as the original end user continues to own or use the product or up to one year from the end-of-sale date for the product, whichever occurs earlier.

Cisco Embedded Support for Cisco DNA Term Components

Cisco Embedded Support delivers the right support for Cisco software products and suites. It will keep your business applications performing as expected and protect your investment. Cisco Embedded Support for the Cisco DNA Essentials and Cisco DNA Advantage term components is included. Cisco Embedded Support provides access to TAC support, major software updates, maintenance and minor software releases, and the Cisco Embedded support site, for increased productivity with anytime access.

Ordering

Ordering Information

Table 19 lists ordering information for Cisco Catalyst 9200 Series switches. To place an order, visit the Cisco Ordering home page at

https://www.cisco.com/web/ordering/ordering-solutions/index.html

Table 19. Ordering information

Switches	
Product number	Product description
C9200-24T-A	Catalyst 9200 24-port Data Switch, Network Advantage
C9200-24T-E	Catalyst 9200 24-port Data Switch, Network Essentials
C9200-24P-A	Catalyst 9200 24-port PoE+ Switch, Network Advantage
C9200-24P-E	Catalyst 9200 24-port PoE+ Switch, Network Essentials
C9200-24PB-A	Catalyst 9200 24-port PoE+, enhanced VRF, Network Advantage
C9200-24PXG-E	Catalyst 9200 24-port dual mGig, 2 x 10G, PoE+, Network Essentials
C9200-24PXG-A	Catalyst 9200 24-port dual mGig, 2 x 10G, PoE+, Network Advantage
C9200-48T-A	Catalyst 9200 48-port Data Switch, Network Advantage
C9200-48T-E	Catalyst 9200 48-port Data Switch, Network Essentials
C9200-48P-A	Catalyst 9200 48-port PoE+ Switch, Network Advantage
C9200-48P-E	Catalyst 9200 48-port PoE+ Switch, Network Essentials
C9200-48PL-A	Catalyst 9200 48-Port partial PoE+ Switch, Network Advantage

Switches	
Product number	Product description
C9200-48PXG-4X-A	Catalyst 9200L 48-port 1/2.5Gbps, 2 x 10G, 4 x 25G PoE+, Network Advantage
C9200L-24T-4G-A	Catalyst 9200L 24-port Data 4 x 1G uplink Switch, Network Advantage
C9200L-24T-4G-E	Catalyst 9200L 24-port Data 4 x 1G uplink Switch, Network Essentials
C9200L-24P-4G-A	Catalyst 9200L 24-port PoE+ 4 x 1G uplink Switch, Network Advantage
C9200L-24P-4G-E	Catalyst 9200L 24-port PoE+ 4 x 1G uplink Switch, Network Essentials
C9200L-48T-4G-A	Catalyst 9200L 48-port Data 4 x 1G uplink Switch, Network Advantage
C9200L-48T-4G-E	Catalyst 9200L 48-port Data 4 x 1G uplink Switch, Network Essentials
C9200L-48P-4G-A	Catalyst 9200L 48-port PoE+ 4 x 1G uplink Switch, Network Advantage
C9200L-48P-4G-E	Catalyst 9200L 48-port PoE+ 4 x 1G uplink Switch, Network Essentials
C9200L-48PL-4G-A	Catalyst 9200L 48-port partial PoE+ 4 x 1G uplink Switch, Network Advantage
C9200L-48PL-4G-E	Catalyst 9200L 48-port partial PoE+ 4 x 1G uplink Switch, Network Essentials
C9200L-24T-4X-A	Catalyst 9200L 24-port Data 4 x 10G uplink Switch, Network Advantage
C9200L-24T-4X-E	Catalyst 9200L 24-port Data 4 x 10G uplink Switch, Network Essentials
C9200L-48T-4X-A	Catalyst 9200L 48-port Data 4 x 10G uplink Switch, Network Advantage
C9200L-48T-4X-E	Catalyst 9200L 48-port Data 4 x 10G uplink Switch, Network Essentials
C9200L-48P-4X-A	Catalyst 9200L 48-port PoE+ 4 x 10G uplink Switch, Network Advantage
C9200L-48P-4X-E	Catalyst 9200L 48-port PoE+ 4 x 10G uplink Switch, Network Essentials
C9200L-48PL-4X-A	Catalyst 9200L 48-port partial PoE+ 4 x 10G uplink Switch, Network Advantage
C9200L-48PL-4X-E	Catalyst 9200L 48-port partial PoE+ 4 x 10G uplink Switch, Network Essentials
C9200L-24PXG-2X-E	Catalyst 9200L 24-port dual mGig, 2 x 10G PoE+, Network Essentials
C9200L-48PXG-4X-E	Catalyst 9200L 48-port dual mGig, 4 x 10G, PoE+, Network Essentials

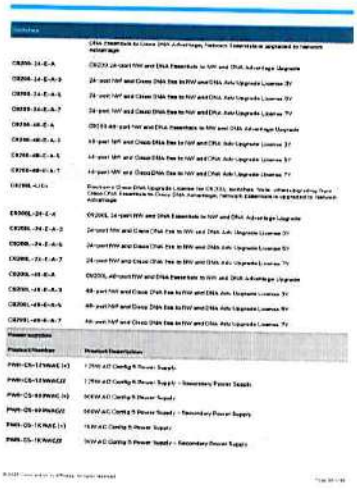
Switches	
C9200L-48PXG-4X-A	Catalyst 9200L 48-port 1/2.5/5Gbps, 4 x 10G PoE+, Network Advantage
C9200L-24PXG-2Y-A	Catalyst 9200L 24-port dual mGig, 2 x 25G, PoE+, Network Essentials
C9200L-24PXG-2Y-E	Catalyst 9200L 24-port dual mGig, 2 x 25G, PoE+, Network Advantage
C9200L-48PXG-2Y-E	Catalyst 9200L 48-port dual mGig, 2 x 25G PoE+, Network Essentials
C9200L-48PXG-2Y-A	Catalyst 9200L 48-port dual mGig, 2 x 25G PoE+, Network Advantage

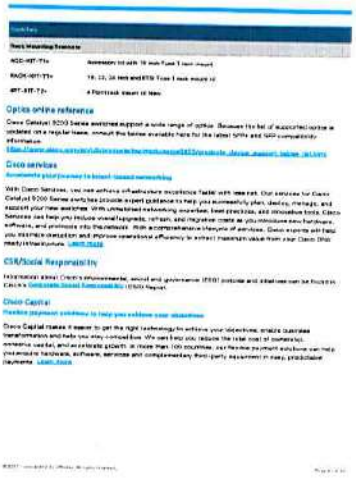
Network modules	
Product number	Product description
C9200-NM-2Y=(1)	Catalyst 9200 2 x 25 GE Network Module, spare
C9200-NM-2Q=(1)	Catalyst 9200 2 x 40GE Network Module, spare
C9200-NM-4G=(1)	Catalyst 9200 4 x 1GE Network Module, spare
C9200-NM-4X=(1)	Catalyst 9200 4 x 10GE Network Module, spare
C9200-NM-BLANK	Catalyst 9200 BLANK Network Module

StackWise-480 and StackWise-160 kit and cables	
Product number	Product description
C9200-ST-KIT=	C9200 Stack kit Spare
C9300L-STACK-KIT=	C9300L Stack kit Spare
STACK-T4-50CM	50CM Type 4 Stacking Cable
STACK-T4-50CM=	50CM Type 4 Stacking Cable, spare
STACK-T4-1M	1M Type 4 Stacking Cable
STACK-T4-1M=	1M Type 4 Stacking Cable, spare
STACK-T4-3M	3M Type 4 Stacking Cable
STACK-T4-3M=	3M Type 4 Stacking Cable, spare

Software licenses	
Product number	Product description
C9200-DNA-P-24	C9200 Cisco DNA Premier Term, 24-Port, Includes Term Licenses for Cisco DNA Advantage, DNA Premier and DNA Add-Ons(e.g. DNA Assurance, DNA Multi-vendor Plug-n-play including Virtual Flow Collector and Management Console). Requires separate purchase of DNA Subscription Software and Cisco DNA Center appliance
C9200-DNA-P-24-3Y	C9200 Cisco DNA Premier, Switches, 24 Port, 3 Year - Cisco DNA, 24-Port PoE+ and SW DNA, 24 Port PoE+

17
teletax





Optics online reference

Cisco Catalyst 9200 Series switches support a wide range of optics. Because the list of supported optics is updated on a regular basis, consult the below available here for the latest optics and SFP compatibility information.

Cisco services

CSR/Social Responsibility

Cisco Capital

Document history

Cisco Catalyst 8200 Series Edge Platforms

© 2021 Cisco and/or its affiliates. All rights reserved.

Contents

© 2021 Cisco and/or its affiliates. All rights reserved.

The Cisco Catalyst 8200 Series Edge Platforms are 5G-ready cloud edge platforms designed for Secure Access Service Edge (SASE), multilayer security, and cloud-native agility to accelerate your journey to cloud.

The Cisco® Catalyst® 8200 Series Edge Platforms with Cisco IOS® XE SD-WAN software deliver Cisco's secure, cloud-scale SD-WAN solution for the small branch. The platforms are purpose-built for performance and integrated SD-WAN services along with flexibility to deliver security and networking services together from the cloud or on premises. They have a wide variety of interface options to choose from, with backward compatibility to existing WAN, LAN, and voice modules. Powered by Cisco IOS XE, a fully programmable software architecture, and API support, the Catalyst 8200 Series can facilitate automation at scale to achieve zero-touch IT capability while migrating workloads to the cloud. The platforms also come with a trustworthy solutions 2.0 infrastructure that secures them against threats and vulnerabilities through advanced integrity verification and remediation of threats.

The 8200 Series is well suited for small and medium-sized enterprise branch offices at optimal price/performance with integrated SD-WAN services.

The Catalyst 8200 Series Edge Platforms are offered in two models: C8200L-1N-4T for the small branch with SASE-compliant, cloud-based security requirements, and C8200-1N-4T for the small to medium-sized branch with requirements for higher throughput, scale, and service flexibility. In addition to supporting SASE-compliant cloud-based security services, the C8200-1N-4T also delivers a flexible system of best-in-class, on-premises security services through container-based apps, using Cisco's third-party ecosystem.

© 2021 Cisco and/or its affiliates. All rights reserved.

Product overview

Product highlights

Table 1. Product highlights

Product feature	Benefits and description
Multicore processors	• C8200-1N-4T uses an Intel® x86 CPU with 8 GB memory default • C8200L-1N-4T uses an Intel x86 CPU with 4 GB memory default • High-performance multicore processors support high-speed WAN connections • Dynamic core allocation architecture will repurpose unused cores into forwarding entities as per the user's configuration
Embedded IPsec VPN hardware acceleration	• C8200-1N-4T enables up to 1 Gbps IPsec traffic • C8200L-1N-4T enables up to 500 Mbps IPsec traffic • Increases scalability for IPsec throughput requirements • SSL and crypto hardware acceleration
Integrated Gigabit Ethernet ports	• Provides four built-in Ethernet WAN ports • Two Ethernet ports are Small Form-Factor Pluggable (SFP) and two are RJ45 ports, enabling fiber as well as copper connectivity
DRAM	• C8200-1N-4T ships with 8 GB DRAM • C8200L-1N-4T ships with 4 GB DRAM • Both models can be upgraded to 16 GB and 32 GB for higher scale and performance
Flash memory support	• Both models have an integrated onboard 8-GB flash and are not upgradable. M.2 storage provides flash upgrade options
M.2 storage	• The C8200-1N-4T is shipped with default 16G M.2 storage and can be upgraded to 32G M.2 USB and 600G M.2 Non-Volatile Memory Express (NVMe) Storage • The C8200L-1N-4T has no default M.2 storage and can be upgraded to 16G, 32G USB and 600G M.2 Non-Volatile Memory Express (NVMe) Storage
Power supply	• Both models use an internal, fixed AC power supply • Power over Ethernet (PoE) is available as an option • PoE ports added in the Network Interface Module (NIM) slot will require an additional external PoE power supply
Modularity and form factor	• 1-Rack Unit (1RU) form factor • Supports NIM and Pluggable Interface Module (PIM) slots
Integrated security	• Hardware-anchored Secure Boot and Secure Unique Device Identification (SUDI) support for Plug and Play to verify the identity of the hardware and software

© 2021 Cisco and/or its affiliates. All rights reserved.

Platform details

Models and configurations

Figure 1.
Catalyst 8200 Series with 1 NIM slot and 4x 1 Gigabit Ethernet WAN ports

Tables 2 and 3 detail platform specifications and performance, respectively.

Table 2. Platform specifications

Model	Description	1G port density	Slots	Memory (DRAM) default	Storage (M.2 SSD) default
C8200-1N-4T	C8200 1RU w/ 1 NIM slot and 4x 1 Gigabit Ethernet WAN ports	4	1 NIM 1 PIM	8 GB	16 GB
C8200L-1N-4T	C8200L 1RU w/ 1 NIM slot and 4x 1 Gigabit Ethernet WAN ports	4	1 NIM 1 PIM	4 GB	16 GB

Platform performance

Table 3a Cisco controller mode (SD-WAN) performance specifications

Feature	C8200-1N-4T	C8200L-1N-4T
SD-WAN IPsec throughput (1400 bytes, clear text)	Up to 1 Gbps	Up to 500 Mbps
SD-WAN IPsec throughput (IMIX,* clear text**)	900 Mbps	400 Mbps
SD-WAN overlay tunnels scale	2500	1500

*IMIX is average packet size of 352 bytes.

**Based on clear text traffic measurement from traffic generator.

Table 3b Cisco autonomous mode (non SD-WAN) performance specifications

Feature	C8200-1N-4T	C8200L-1N-4T
IPv4 forwarding throughput (1400 bytes)	Up to 3.8 Gbps	Up to 3.8 Gbps
IPsec throughput (1400 bytes, clear text**)	Up to 1 Gbps	Up to 500 Mbps
Number of IPsec static virtual tunnel interface (SVTI) tunnels	2500	1500

**Based on clear text traffic measurement from traffic generator.

Table 3c Cisco autonomous mode (non SD-WAN) system scalability

Feature	C8200-1N-4T	C8200L-1N-4T
Number of access control lists (ACLs) per system	4000	4000
Number of IPv4 access control entries (ACEs) per system	72,000	72,000
Number of IPv4 routes	1.6M with default 8 GB, up to 4M with 32 GB	800,000 with default 4 GB, up to 4M with 32 GB
Number of IPv6 routes	1.5M with default 8 GB, up to 4M with 32 GB	800,000 with default 4 GB, up to 4M with 32 GB
Number of queues	16,000	16,000
Number of Network Address Translation (NAT) sessions	1.2M with default 8 GB, up to 2M with 32 GB	600,000 with default 8 GB, up to 2M with 32 GB
Number of firewall sessions	512,000	512,000
Number of Virtual Route Forwarding (VRF) instances	4000	2000

Overall platform benefits

Accelerated services with Cisco Software-Defined WAN

Cisco SD-WAN is a set of intelligent software services that allow you to connect users, devices, and [illegible] office locations reliably and securely across a diverse set of WAN transport links. The Cisco Catalyst 8000 Edge Platforms Family can dynamically route traffic across the "best" link based on up-to-the-minute application and network conditions for great application experiences. With Cisco SD-WAN you get tight control over application performance, bandwidth usage, data privacy, and availability of your WAN links. This control is critical as branches conduct greater volumes of mission-critical business using both on-premises and cloud controllers.

Application performance optimization

Ensure that SD-WAN networks meet Service-Level Agreements (SLAs) and maintain strong performance, even if network problems occur. With branch multicloud access, you can accelerate your Software-as-a-Service (SaaS) applications with a simple template push from the SD-WAN controller. Features such as TCP optimization, Forward Error Correction (FEC), and packet duplication enhance application performance for a better user experience.

Multilayer security

You can now move your traditional and complex WAN networks into an agile, software-defined WAN with integrated security. The Catalyst 8200 Series Edge Platforms connect branch offices to the Internet and cloud with industry-leading protection against major web attacks. Secure Direct Internet Access (DIA) from the branches helps optimize branch workloads for improved performance, specifically for cloud-hosted applications. At the same time, secure DIA helps ensure that your branch is protected from external threats.

Application visibility*

Applications and users are more distributed than ever, and the internet has effectively become the new enterprise WAN. As organizations continue to embrace internet, cloud, and SaaS, network and IT teams are challenged to deliver consistent and reliable connectivity and application performance over networks and services they don't own or directly control.

The Catalyst 8200 Series Edge Platforms are integrated with Cisco ThousandEyes internet and cloud intelligence. IT managers now have expanded visibility, including hop-by-hop analytics, into network underlay, proactive monitoring of SD-WAN overlay, and performance measurement of SaaS applications. This granular visibility ultimately lowers the Mean Time to Identification of Issues (MTTI) and accelerates resolution time.

*Available in Release 17.6, targeted for Q3CY21.

Unified communications

The Catalyst 8200 Series Edge Platforms offer rich voice services in both SD-WAN and traditional Cisco IOS XE software feature stacks. Cisco is the only SD-WAN vendor to natively integrate analog and digital IP directly into single Customer Premises Equipment (CPE), reducing CapEx and OpEx. In SD-WAN mode, the Catalyst 8200 Series also helps prevent internal and external outages with Survivable Remote Site Telephony (SRST), enabling branch routers to assume the role of call control PBX for telephony survivability. They also continue to support a long list of traditional Cisco IOS XE voice use cases such as Cisco Unified Border Element (CUBE), Cisco Unified Communications Manager, Session Border Controller, SRST, ISDN, and voice over IP.

Cloud-native agility with a programmable software architecture

Cisco continues to offer a feature-rich traditional Cisco IOS XE routing stack on the Catalyst 8200 Series. IP routing, IPsec, QoS, firewall, NAT, Network-Based Application Recognition (NBAR), Flexible NetFlow (FNF), and many other features are part of Cisco IOS XE, a fully programmable software architecture with API support and a wide variety of protocols and configurations. With an integrated software image and a single binary file, you can now choose between Cisco IOS XE SD-WAN and Cisco IOS XE. And you can easily move from one to the other when you choose to do so.

5G-ready

The Catalyst 8200 Series Edge Platforms are built for future 5G networks. With the higher throughputs from Cat18 LTE and 5G, wireless WAN solutions are becoming feasible options for primary transport use cases. These platforms will support both integrated pluggable modules as well as external cellular gateways with Cat18 LTE and 5G capability for improved throughput that addresses those use cases. Either an integrated or external gateway can be chosen based on a specific branch's cellular coverage.

Interface flexibility

Switched and routed ports

The Catalyst 8200 Series continues Cisco's support for 4- and 8-port Layer 2 modules with PoE capability for a single-box solution, providing both switching and routing for a small branch.

Voice modules

The Catalyst 8200 Series continues Cisco's support for a variety of voice modules for the different vo[illegible]ads at the branch. Voice module examples include Foreign Exchange Station (FXS), Foreign Exchange Office (FXO), Digital Signal Processor (DSP), etc.

Supported modules

Table 4. Modules supported

Product number	Description
LAN modules	
NIM-ES2-4	Cisco 4-port Gigabit Ethernet switch NIM
NIM-ES2-8	Cisco 8-port Gigabit Ethernet switch NIM
NIM-ES2-8-P	Cisco 8-port Gigabit Ethernet switch NIM with PoE support
Voice modules	
NIM-2FXO	2-port FXO NIM
NIM-4FXO	4-port FXO NIM
NIM-2FXSP	2-port FXS NIM
NIM-4FXSP	4-port FXS NIM
NIM-2FXSP/4FXOP	2-port FXS and 4-port FXO NIM
NIM-4E/M	4-port E/M NIM
NIM-2BRI-NT/TE	2-port BRI (NT and TE) NIM
NIM-4BRI-NT/TE	4-port BRI (NT and TE) NIM
NIM-PVDM-32	32-channel voice DSP NIM
NIM-PVDM-64	64-channel voice DSP NIM
NIM-PVDM-128	128-channel voice DSP NIM
NIM-PVDM-256	256-channel voice DSP NIM
NIM-1MFT-T1/E1	1-port multiflex trunk voice/clear-channel data T1/E1 module
NIM-2MFT-T1/E1	2-port multiflex trunk voice/clear-channel data T1/E1 module

Product number	Description
NIM-4MFT-T1/E1	4-port multiflex trunk voice/clear-channel data T1/E1 module
NIM-8MFT-T1/E1	8-port multiflex trunk voice/clear-channel data T1/E1 module
DSL/broadband	
NIM-VAB-A	Multi-mode VDSL2/ADSL/2/2+ NIM Annex A
NIM-VA-B	Multi-mode VDSL2/ADSL/2/2+ NIM Annex B
NIM-VAB-M	Multi-mode VDSL2/ADSL/2/2+ NIM Annex M
NIM-4SHDSL-EA	Multi-mode G.SHDSL NIM
Channelized T1/E1 and ISDN PRI	
NIM-1CE1T1-PRI	1-port Multiflex trunk voice/channelized data T1/E1 module
NIM-2CE1T1-PRI	2-port Multiflex trunk voice/channelized data T1/E1 module
NIM-8CE1T1-PRI	8-port Multiflex trunk voice/channelized data T1/E1 module
ISDN BRI WAN interface	
NIM-2BRI-S/T	2-port ISDN BRI WAN interface card for data
NIM-4BRI-S/T	4-port ISDN BRI WAN interface card for data
Serial WAN interface	
NIM-1T	1-port serial high-speed WAN interface card
NIM-2T	2-port serial high-speed WAN interface card
NIM-4T	4-port serial high-speed WAN interface card
[illegible]VAN interface	
[illegible]A	16-port Asynchronous Module
NIM-24A	24-port Asynchronous Module
Wireless WAN (LTE)	
P-5GS6-GL	5G Sub-6 GHz Pluggable - Global
P-LTEAP18-GL	4G/CAT18 LTE Advanced Pro Pluggable - Global
P-LTEA-EA	4G/CAT6 LTE Advanced Pluggable for North American and Europe
P-LTEA-LA	4G/ CAT6 LTE Advanced Pluggable for APAC, ANZ, and LATAM
NIM-LTEA-EA	LTE Advanced for Europe and North America

© 2021 Cisco and/or its affiliates. All rights reserved.

Product number	Description
NIM-LTEA-LA	LTE Advanced for Asia Pacific, Australia and LATAM

Memory, storage, and accessory options

Table 5. Memory, storage, and accessory options

Product number	Description
MEM-C8200-8GB	Cisco C8200 Edge Platform - 8 GB Memory
MEM-C8200-16GB	Cisco C8200 Edge Platform - 16 GB Memory
MEM-C8200-32GB	Cisco C8200 Edge Platform - 32 GB Memory
M2USB-16G	Cisco C8000 Edge Platform - 16 GB M.2 USB SSD Storage
M2USB-32G	Cisco C8000 Edge Platform - 32 GB M.2 USB SSD Storage
SSD-M2NVME-600G	Cisco C8000 Edge Platform - 600 GB M.2 NVMe SSD Storage
C8200-RM-19	Cisco C8200 1RU Edge Platform - Rack Mount kit - 19"
C8200-RM-23	Cisco C8200 1RU Edge Platform - Rack Mount kit - 23"
C8200-WM-1R	Cisco C8200 1RU Edge Platform - Wall Mount Kit
C8200-RFID-1R	Cisco C8200 1RU Edge Platform - RFID
C8200-NIM-BLANK	Cisco C8200 NIM Blank
C8200-PIM-BLANK	Cisco C8200 PIM Blank

Optics and transceivers modules

Find a full list of optics and transceivers here.

Power supplies

Table 6. Power supply specifications

Power supply feature	Default	PWR-CC1-150WAC optional external PSU for PoE
Power maximum rating	100W	150W For PoE only PoE budget: 150W
Input-voltage range and frequency	90 to 264 VAC 47 to 63 Hz	90 to 264 VAC 47 to 63 Hz
Power supply efficiency	85%	Avg 89%

© 2021 Cisco and/or its affiliates. All rights reserved.

Power supply feature	Default	PWR-CC1-150WAC optional external PSU for PoE
Input current	1.5A max	2A max
Output ratings	12V 8.4A	54V 2.78A
[illegible] holdup time	20 ms	10 ms
[illegible] supply input receptacles	IEC 320 C14	IEC 320 C14
Power cord rating	10A	10A

Asset management: The Catalyst 8200 Series Edge Platforms have an embedded RFID tag that holds the serial number and product ID for easy asset and inventory management using commercial RFID readers. The RFID tag is external and can be easily removed if needed or can be unselected at the time of ordering. It also features an extendable label tag providing the same information. A QR code on this tag makes asset management easy by simply scanning the label using a smartphone QR reader.

Software requirements

Cisco DNA Software for the Catalyst 8200 Series offers comprehensive solutions for enterprise branch networks.

Table 7. Minimum software requirements

Platform product ID (PID)	Description	Minimum software requirement
C8200-1N-4T	Cisco Catalyst 8200 Series Edge Platform	Cisco IOS XE Software Release 17.4.1
C8200L-1N-4T	Cisco Catalyst 8200 Series Edge Platform	Cisco IOS XE Software Release 17.5.1

Table 8. ThousandEyes requirements

Feature	Requirements
Cisco ThousandEyes	ThousandEyes is natively integrated with eligible Catalyst 8200 Series Edge Platforms with a minimum 8 GB DRAM and 8 GB bootflash/storage. Additional memory and storage will be necessary for concurrently running the ThousandEyes agent with containerized SD-WAN security services.

© 2021 Cisco and/or its affiliates. All rights reserved.

Table 9a. Software features and protocols for autonomous mode

Feature	Description
Protocols	IPv4, IPv6, static routes, Routing Information Protocol Versions 1 and 2 (RIP and RIPv2), Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Border Gateway Protocol (BGP), BGP Route Reflector, Intermediate System-to-Intermediate System (IS-IS), Multicast Internet Group Management Protocol Version 3 (IGMPv3), Protocol Independent Multicast Sparse Mode (PIM SM), PIM Source-Specific Multicast (SSM), Resource Reservation Protocol (RSVP), Cisco Discovery Protocol, Encapsulated Remote Switched Port Analyzer (ERSPAN), Cisco IOS IP Service-Level Agreements (IPSLA), Call Home, Cisco IOS Embedded Event Manager (EEM), Internet Key Exchange (IKE), ACLs, Ethernet Virtual Connections (EVC), Dynamic Host Configuration Protocol (DHCP), Frame Relay, DNS, Locator ID Separation Protocol (LISP), Hot Standby Router Protocol (HSRP), RADIUS, Authentication, Authorization, and Accounting (AAA), Application Visibility and Control (AVC), Distance Vector Multicast Routing Protocol (DVMRP), IPv4-to-IPv6 Multicast, Multiprotocol Label Switching (MPLS), Layer 2 and Layer 3 VPN, IPsec, Layer 2 Tunneling Protocol Version 3 (L2TPv3), Bidirectional Forwarding Detection (BFD), IEEE 802.1ag, and IEEE 802.3ah
Encapsulations	Generic Routing Encapsulation (GRE), Ethernet, 802.1q VLAN, Point-to-Point Protocol (PPP), Multilink Point-to-Point Protocol (MLPPP), Frame Relay, Multilink Frame Relay (MLFR) (FR.15 and FR.16), High-Level Data Link Control (HDLC), serial (RS-232, RS-449, X.21, V.35, and EIA-530), and PPP over Ethernet (PPPoE)
Traffic management	QoS, Class-Based Weighted Fair Queuing (CBWFQ), Weighted Random Early Detection (WRED), Hierarchical QoS, Policy-Based Routing (PBR), Performance Routing (PfR), and NBAR
Cryptographic algorithms	Encryption: Data Encryption Standard (DES), 3DES, Advanced Encryption Standard (AES)-128 or AES-256 (in Cipher Block Chaining [CBC] and Galois/Counter Mode [GCM]) Authentication: RSA (748/1024/2048 bit), ECDSA (256/384 bit) Integrity: MD5, SHA, SHA-256, SHA-384, SHA-512
Unified communications	Call Admission Control (CAC), CUBE, Cisco Unified Communications Manager, dialer, ISDN, Interactive Voice Response (IVR), RADIUS, RFC 4040-based clear channel codec signaling with Session Initiation Protocol (SIP), Resource Reservation Protocol (RSVP), RTP Control Protocol (RTCP), Service Advertisement Framework (SAF), Session Border Controller (SBC), SIP for voice over IP (VoIP), SRST, Secure Real-Time Transport Protocol (SRTP), Voice over Frame Relay (FRF.11), VoIP, and voice modules

© 2021 Cisco and/or its affiliates. All rights reserved.

Table 9b. Software features and protocols for controller mode

Feature	Description
Core features	IPv4, IPv6, static routes, OSPF, EIGRP, BGP, Overlay Management Protocol (OMP), Application Aware Routing (AAR), Traffic Engineering, service insertion, zero trust, whitelisting, tamper-proof module, DTLS/TLS, IPsec, classification, prioritization, low latency queuing, remarking, shaping, scheduling, policing, mirroring, Multicast IPv4 support, service advertisement and insertion policy, Simple Network Management Protocol (SNMP), Network Time Protocol (NTP), DNS client, DHCP, DHCP client, DHCP server, DHCP relay archival, syslog, Secure Shell (SSH), Secure Copy (SCP), Cflowd v10 IPFIX export, IPv6 for transport side, Virtual Router Redundancy Protocol (VRRP), MPLS, NAT (DIA, service-side, overload/PAT, NAT64, etc.), NAT pools, split DNS, ACLs, BFD, NETCONF over SSH, CLI, NTP server support, BFD with service-side BGP, BGP community propagation to OMP, 6 SLA for AAR, Cisco TrustSec®/SD-Access (inline scalable group tag [SGT] propagation), custom app with Software-Defined AVC (SD-AVC), multicast AAR, dynamic on-demand tunnels, OSM, OSPFv3, route policies, multi-VRF support
Encapsulations	Generic Routing Encapsulation (GRE), Ethernet, 802.1q VLAN
Application experience	QoS, FEC, Class of Service (CoS) marking, Weighted Random Early Detection (WRED), Hierarchical QoS, PBR, NBAR, SD-AVC, per-tunnel QoS, Cloud OnRamp for SaaS, Enhanced Office 365 traffic steering, direct access, FNF
Cryptographic algorithms	Encryption: AES-256 (in CBC and GCM modes), Internet Key Exchange (IKE), Cisco Public Key Infrastructure (PKI) Authentication: AAA, RSA (2048 bit), ESP-256-CBC, HMAC-SHA1, ECDSA (256/384 bit) Integrity: SHA-1, SHA-2
Security: C8200-1N-4T	Built-in end-to-end segmentation (VPNs), zone-based firewall (ZBFW), PKI, Cisco DNA Layer Security, Snort® IPS/IDS, URL filtering, Secure Malware Defense, Secure Malware Analytics, Application-Level Gateway (ALG) for ZBFW, Secure Internet Gateway (SIG)
Security: C8200L-1N-4T	Built-in end-to-end segmentation (VPNs), ZBFW, PKI, Cisco DNA Layer Security, SIG
Unified communications	CUBE Connector, SRST, voice modules

Licensing

The Catalyst 8200 Series Edge Platforms are offered only with a Cisco DNA Software subscription, Enterprise Agreement, and Managed Service Licensing Agreement (MSLA). For more details, refer to this licensing guide.

Cisco DNA stack:

- Cisco DNA Essentials
- Cisco DNA Advantage
- Cisco DNA Premier

Network stack:

- Network Essentials
- Network Advantage

For a more detailed overview on Cisco Licensing, go to cisco.com/go/licensingguide

© 2021 Cisco and/or its affiliates. All rights reserved.

Cisco ThousandEyes*

A valid ThousandEyes agent license is required to activate the ThousandEyes agent. Existing ThousandEyes subscriptions can be leveraged on eligible Catalyst 8200 Series platforms. Additional ThousandEyes subscription information can be found here.

*Available in Release 17.6, targeted for Q3CY21.

Product sustainability

Information about Cisco's environmental, Social and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability reporting.

Sustainability Topic		Reference
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries and packaging	WEEE Compliance
	Sustainability inquiries	Contact: csr_inquiries@cisco.com
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
	Operating and nonoperating conditions	Table 10. Mechanical specifications
	Mean Time Between Failures (MTBF)	Table 10. Mechanical specifications
	Safety and EMC (emissions, immunity and ETSI/EN)	Table 10. Mechanical specifications
Power	Power Supply	Table 1. Product highlights Table 6. Power supply specifications
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Dimensions and weight	Table 10. Mechanical specifications

Specifications

Table 10. Mechanical specifications

Description	Specification
Part number	C8200-1N-4T
Dimensions (H x W x D)	1.73 x 17.25 x 11.8 in. (4.39 x 43.81 x 29.97 cm)
Rack Units (RU)	1RU
Chassis weight	10 lb (4.54 kg)
Input voltage	AC: 90 to 264 VAC
Operating temperature	32° to 104°F

© 2021 Cisco and/or its affiliates. All rights reserved.

Description	Specification
	(0° to 40°C)
Storage temperature	-40° to 150°F (-40° to 70°C)
Relative humidity operating and nonoperating noncondensing	Ambient (noncondensing) operating: 5% to 85% Ambient (noncondensing) nonoperating and storage: 5% to 95%
Altitude	0 to 10,000 feet (0 to 3050 meters)
Mean Time Between Failures (MTBF)	692,577 hours

Table 11. Safety and compliance

Description	Specification
Safety certifications	UL 60950-1 CAN/CSA-C22.2 No. 60950-1 EN 60950-1 IEC 60950-1 AS/NZS 60950-1 IEC/EN 60825 Laser Safety FDA: Code of Federal Regulations Laser Safety
EMC (emissions)	47 CFR Part 15 Class A ICES 003 Class A AS/NZS CISPR 32 Class A CISPR 32 Class A EN55032 Class A VCCI-CISPR 32 Class A CNS-13438 Class A KN32 Class A IEC/EN 61000-3-2: Power Line Harmonics IEC/EN 61000-3-3: Voltage Fluctuations and Flicker

© 2021 Cisco and/or its affiliates. All rights reserved.

Description	Specification
EMC (immunity)	IEC/EN-61000-4-2: Electrostatic Discharge Immunity IEC/EN-61000-4-3: Radiated Immunity IEC/EN-61000-4-4: Electrical Fast Transient Immunity IEC/EN-61000-4-5: Surge AC, DC, and Signal Ports IEC/EN-61000-4-6: Immunity to Conducted Disturbances IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations KN35
EMC (ETSI/EN)	EN300 386: Telecommunications Network Equipment (EMC) EN55032: Multimedia Equipment (Emissions) EN55024: Information Technology Equipment (Immunity) EN55035: Multimedia Equipment (Immunity) EN61000-6-1: Generic Immunity Standard

Services

Cisco Customer Experience support services for Catalyst 8000 platforms and Cisco DNA Software for SD-WAN and Routing

This section discusses the Cisco support services available for the Catalyst 8000 platforms and associated Cisco DNA Software for SD-WAN and Routing, as well as optional support service offers.

- **Catalyst 8000 platforms:** Cisco Solution Support is the default and recommended Cisco support service. However, Cisco Solution Support is not mandatory; it can be removed or replaced with another Cisco support service or partner service per the customer's preference.
- **Cisco DNA Software for SD-WAN and Routing:** Cisco Solution Support is the default Cisco support service. However, Cisco Solution Support is not mandatory; the customer may choose to use the Cisco Subscription Embedded Software Support included with the purchase of this software.

Note:

- When Solution Support is selected, it must be ordered on both the Catalyst 8000 platform and Cisco DNA Software for SD-WAN and Routing for complete customer entitlement to this premium support service.
- SD-WAN and Routing customers with Solution Support or Cisco Subscription Embedded Software Support are entitled to maintenance releases and software updates for **Cisco DNA SD-WAN a Routing software only**. Support for the Catalyst 8000 platform's OS and network stack, along updates, is covered by the support contract on the Catalyst 8000 platform.

© 2021 Cisco and/or its affiliates. All rights reserved.

Cisco Solution Support is a premium support purpose-built for today's multiproduct, multivendor network environments and provides:

- A primary point of contact, centralizing support across a solution deployment
- Solution, product, and interoperability expertise
- No requirement for customers to isolate their issue to a product to open a case
- 30-minute service response objective for Severity 1 and 2 cases
- Prioritized case handling over product support cases
- Product support team coordination (Cisco and Solution Support Alliance Partners)
- Accountability for multiproduct, multivendor issue management from first call to resolution, no matter where the issue resides

Learn more about Cisco Solution Support at www.cisco.com/go/solutionsupport

Cisco Subscription Embedded Software Support includes:

- Access to support and troubleshooting via online tools and web case submission. Case severity or escalation guidelines are not applicable.
- Cisco Technical Assistance Center (TAC) access 24 hours per day, 7 days per week to assist by telephone, or web case submission and online tools with application software use and troubleshooting issues.
- Access to www.cisco.com, providing helpful technical and general information on Cisco products, as well as access to Cisco's online Software Center library.

Note: No additional products or fees are required to receive embedded support for Cisco DNA Software for SD-WAN and Routing. However, if using embedded support for this software, hardware support for the Catalyst 8000 platforms must be purchased separately, as Cisco Subscription Embedded Software Support does not cover hardware. In this case, Cisco Smart Net Total Care™ Service is recommended for the Catalyst 8000 platforms.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital® makes it easier to get the right technology to achieve your objectives, enable business transformation, and stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

© 2021 Cisco and/or its affiliates. All rights reserved.

Ordering information

To place an order, visit the Cisco Ordering Home Page. To download software, visit the Cisco Software Center.

For more information

For more information about the Cisco Catalyst 8200 Series Edge Platforms, visit https://www.cisco.com/go/C8200 or contact your local Cisco account representative.

Document history

New or Revised Topic	Described In	Date
Updated licensing information	Licensing	Jun 25, 2021

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 https://www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: https://www.cisco.com/go/trademarks. Third-party trademarks mentioned 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. (1110R)

Printed in USA

C78-744550-04 09/21

© 2021 Cisco and/or its affiliates. All rights reserved.

Cisco Catalyst 9800-CL Wireless Controller for Cloud

© 2021 Cisco and/or its affiliates. All rights reserved.

Contents

© 2021 Cisco and/or its affiliates. All rights reserved.

Built from the ground up for intent-based networking

:t overview

Figure 1.
Examples of compatible clouds

Built from the ground-up for the intent-based network and Cisco DNA, Cisco® Catalyst® 9800 Series Wireless Controllers are Cisco IOS® XE based and integrate the RF excellence of Cisco Aironet® access points, creating a best-in-class wireless experience for your evolving and growing organization. The 9800 Series is built on an open and programmable architecture with built-in security, streaming telemetry, and rich analytics.

The Cisco Catalyst 9800 Series Wireless Controllers are built on the three pillars of network excellence –always on, secure, and deployed anywhere – which strengthen the network by providing the best wireless experience without compromise, while saving time and money.

The Cisco Catalyst 9800-CL is the next generation of enterprise-class wireless controllers for cloud, with seamless software updates for distributed branches and midsize campuses to large enterprises and service providers.

The Cisco Catalyst 9800-CL controller is feature rich and enterprise ready to power your business-critical operations and transform end-customer experiences:

- High availability and seamless software updates, enabled by hot and cold patching, keep your clients and services **always** on in planned and unplanned events.
- **Secure** air, devices, and users with the Cisco Catalyst 9800-CL. Wireless infrastructure becomes the strongest first line of defense with Cisco Encrypted Traffic Analytics (ETA) and Software-Defined Access (SD-Access). The controller comes with built-in security: runtime defenses, image signing and integrity verification.
- **Deploy anywhere** to enable wireless connectivity everywhere. Whether in a public or private cloud, the Cisco Catalyst 9800-CL best meets your organization's needs.
- Built on a modular operating system, the 9800-CL features open and programmable APIs that enable **automation** of day-0 to day-N network operations. Model-driven streaming telemetry provides deep insights into the **health of your network and clients.**

© 2021 Cisco and/or its affiliates. All rights reserved.

- Cisco User Defined Network, a feature available in Cisco DNA Center, allows IT to give end users control of their very own wireless network partition on a shared network. End users can then remotely and securely deploy their devices on this network. Perfect for university dormitories or extended hospital stays, Cisco User Defined Network grants both device security and control, allowing each user to choose who can connect to their network.
- The Wi-Fi 6 readiness dashboard is a new dashboard in the Assurance menu of Cisco DNA Center. It will look through the inventory of all devices on the network and verify device, software, and client compatibility with the new Wi-Fi 6 standard. After upgrading, advanced wireless analytics will indicate performance and capacity gains as a result of the Wi-Fi 6 deployment. This is an incredible tool that will help your team define where and how the wireless network should be upgraded. It will also give you insights into the access point distribution by protocol (802.11 ac/n/abg), wireless airtime efficiency by protocol, and granular performance metrics.
- With Cisco In Service Software Upgrade (ISSU), network downtime during a software update or upgrade is a thing of the past. ISSU is a complete image upgrade and update while the network is still running. The software image—or patch—is pushed onto the wireless controller while traffic forwarding continues uninterrupted. All access point and client sessions are retained during the upgrade process. With just a click, your network automatically upgrades to the newest software.

Cisco Catalyst 9800-CL for private cloud

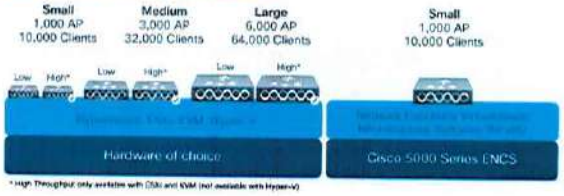


Figure 2.
Cisco Catalyst 9800-CL for private cloud

© 2021 Cisco and/or its affiliates. All rights reserved.

Key highlights

- VMware ESXi, KVM, Hyper-V, and Cisco NFVIS (on ENCS) supported
- Supports centralized, Cisco FlexConnect®, mesh, and fabric (SD-Access) deployment modes
- Multiple scale and throughput* profiles with a single deployment package to best meet your organization's needs
  - **Small (low / high throughput):** Designed for distributed branches and small campuses supporting up to 1000 Access Points (APs) and 10,000 clients
  - **Medium (low / high throughput):** Designed for medium-sized campuses supporting up to 3000 APs and 32,000 clients
  - **Large (low / high throughput):** Designed for large enterprises and service providers supporting up to 6000 APs and 64,000 clients
- One deployment package for all the scale templates. Pick the deployment size and the throughput profile when you instantiate the Virtual Machine (VM)
- Supports up to 2.1 Gbps of throughput in a centralized wireless deployment (low-throughput profile without SR-IOV)
- With a high (enhanced) throughput profile, up to 5 Gbps can be reached on ESXi and KVM with the right set of network cards and resources (SR-IOV-enabled NIC card)
- An intuitive bootstrap wizard is available during the VM instantiation to boot the wireless controller with recommended parameters
- Optimize your branch by deploying the 9800-CL as a virtual machine on the Cisco 5000 Series Enterprise Network Compute System (ENCS) running Cisco NFVIS

*High-throughput profiles are only available with ESXi and KVM hypervisors.

© 2021 Cisco and/or its affiliates. All rights reserved.

Cisco Catalyst 9800-CL for public cloud

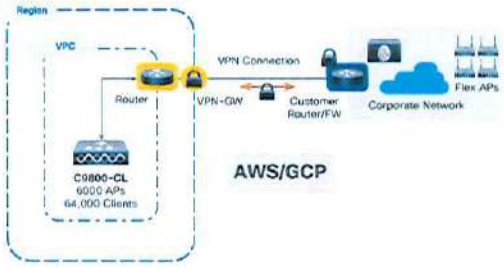


Figure 3,
Cisco Catalyst 9800-CL for public cloud

Key highlights

- Cisco Catalyst 9800-CL is available as an Infrastructure-as-a-Service (IaaS) solution on the Amazon Web Services (AWS) and Google Cloud Platform (GCP) Marketplaces
- Supported only with managed VPN deployment mode:
  - The 9800-CL should be instantiated within a Virtual Private Cloud (VPC)
  - A VPN tunnel has to be established from the customer site to AWS or GCP to enable communica between the Cisco access point and 9800-CL wireless controller
- Cisco FlexConnect central authentication and local switching
- Available on AWS GovCloud
- Supports up to 6000 access points and 64,000 clients
- Deploy a wireless controller instance in AWS using cloud-formation templates provided by Cisco (recommended) or by manually using the EC2 console
- Deploy a wireless controller in GCP using the guided workflow in the marketplace

© 2021 Cisco and/or its affiliates. All rights reserved.

Features

Table 1. Key features

Metric	Value
Maximum number of access points	Up to 6000
Maximum number of clients	64,000
Maximum throughput (low profile without SR-IOV)*	2.1 Gbps
Maximum throughput (high profile with SR-IOV)**	5 Gbps
Maximum WLANs	4096
Maximum VLANs	4096
Deployment modes	Centralized, Cisco FlexConnect, and fabric wireless (SD-Access)
License	Smart License enabled
Operating system	Cisco IOS XE Software
Management	Cisco DNA Center, Cisco Prime® Infrastructure, integrated WebUI, and third party (open standards APIs)***
Interoperability	AireOS-based controllers***
Policy engine	Cisco Identity Services Engine***
Location platform	Cisco Connected Mobile Experiences (CMX), Cisco DNA Spaces***
Access points	Aironet 802.11ac Wave 1 and Wave 2, Cisco Catalyst 9100 802.11ax access points

* For traffic with large (1374 bytes) packet size

** A high-throughput profile is supported on ESXi and KVM hypervisors only. Throughput numbers are with SR-IOV-enabled NICs.

*** For information on compatibility, visit: Compatibility Guide

Always on

Seamless software updates enable faster resolution of critical issues, introduction of new access points with zero downtime and flexible software upgrades. Stateful Switchover (SSO) with 1:1 active standby and N+1 redundancy keeps your network, services, and clients always on, even in unplanned events.

© 2021 Cisco and/or its affiliates. All rights reserved.

Secure

Secure air, devices, and users with the Cisco Catalyst 9800-CL. Wireless infrastructure becomes the stror first line of defense with ETA and SD-Access. The controllers come with built-in security: runtime defens Image signing, and integrity verification. Cisco Advanced Wireless Intrusion Prevention System (awIPS) is complete wireless security solution that uses the Cisco Unified Access' infrastructure to detect, locate, mitigate, and contain wired and wireless rogues and threats.

Deploy anywhere

Whether in a public or private cloud, the Cisco Catalyst 9800-CL wireless controllers can be deployed anywhere for wireless everywhere. The 9800-CL meets the needs of your branch and campus network deployments.

Open and programmable

The controllers are built on the Cisco IOS XE operating system, which offers a rich set of open standards-based programmable APIs and model-driven telemetry that provide an easy way to automate day-0 to day-N network operations.

Key specifications

Table 2. Key specifications

Metric	Private cloud			Public cloud		
	Small	Medium	Large	Small	Medium	Large
Deployment modes supported	Centralized, Cisco FlexConnect, fabric (SD-Access)	Centralized, Cisco FlexConnect, fabric (SD-Access)	Centralized, Cisco FlexConnect, fabric (SD-Access)	Cisco FlexConnect (local switching only)	Cisco FlexConnect (local switching only)	Cisco FlexConnect (local switching only)
vCPUs required* (Hyperthreading is not supported)	4 - low throughput 7 - high throughput	6 - low throughput 9 - high throughput	10 - low throughput 13 - high throughput	4	6	10
Preferred mode for high throughput*	SR-IOV	SR-IOV	SR-IOV	All traffic will be locally switched	All traffic will be locally switched	All traffic will be locally switched
NIC needed for SR-IOV	Intel x710 / Cisco Intel x710 adapter	Intel x710 / Cisco Intel x710 adapter	Intel x710 / Cisco Intel x710 adapter	All traffic will be locally switched	All traffic will be locally switched	All traffic will be locally switched
Drivers needed for SR-IOV	ESXi - i40en KVM - i40e	ESXi - i40en KVM - i40e	ESXi - i40en KVM - i40e	All traffic will be locally switched	All traffic will be locally switched	All traffic will be locally switched
RAM required (GB)	8	16	32	8	16	32
Recommended hard disk space (GB)	16	16	16	16	16	16

© 2021 Cisco and/or its affiliates. All rights reserved.

Metric	Private cloud			Public cloud		
Hypervisors and cloud providers supported	ESXi 6.0/6.5/6.7, KVM, Hyper-V, NFVIS	ESXi 6.0/6.5/6.7, KVM, Hyper-V, NFVIS	ESXi 6.0/6.5/6.7, KVM, Hyper-V, NFVIS	AWS, GCP	AWS, GCP	AWS, GCP
Maximum number of access points	1000	3000	6000	1000	3000	6000
Maximum number of clients	10,000	32,000	64,000	10,000	32,000	64,000
Maximum throughput (low profile without SR-IOV)	2.1 Gbps**	2.1 Gbps**	2.1 Gbps**	All traffic will be locally switched	All traffic will be locally switched	All traffic will be locally switched
Maximum throughput (high profile with SR-IOV)	5 Gbps	5 Gbps	5 Gbps	All traffic will be locally switched	All traffic will be locally switched	All traffic will be locally switched
Maximum WLANs	4096	4096	4096	4096	4096	4096
Maximum VLANs	4096	4096	4096	4096	4096	4096
Maximum site tags	1000	3000	6000	1000	3000	6000
Maximum APs per site	100	100	100	100	100	100
Maximum policy tags	1000	3000	6000	1000	3000	6000
Maximum RF tags	1000	3000	6000	1000	3000	6000
Maximum RF [illegible]	2000	6000	12,000	2000	6000	12,000
[illegible]n policy	1000	1000	1000	1000	1000	1000
Maximum Flex profiles	1000	3000	6000	1000	3000	6000
vNIC adapters	ESXi: VMXNET3, E1000E, E1000 KVM: VIRTIO Hyper-V: NetVSC	ESXi: VMXNET3, E1000E, E1000 KVM: VIRTIO Hyper-V: NetVSC	ESXi: VMXNET3, E1000E, E1000 KVM: VIRTIO Hyper-V: NetVSC	-	-	-

© 2021 Cisco and/or its affiliates. All rights reserved.

Metric	Private cloud			Public cloud		
Virtual switch	ESXi: vSwitch KVM: OVS Linux Bridge (brctl) Hyper-V: Hyper-V Virtual Switch	ESXi: vSwitch KVM: OVS Linux Bridge (brctl) Hyper-V: Hyper-V Virtual Switch	ESXi: vSwitch KVM: OVS Linux Bridge (brctl) Hyper-V: Hyper-V Virtual Switch	-	-	-
VMware vMotion***	Yes	Yes	Yes	-	-	-
VMware Snapshot***	Yes	Yes	Yes	-	-	-
VMware Distributed Resource Scheduler****	Yes	Yes	Yes	-	-	-
VMware NIC Teaming****	Yes	Yes	Yes	-	-	-
Hyper-V Checkpoint	Yes	Yes	Yes	-	-	-
Hyper-V NIC Teaming	Yes	Yes	Yes	-	-	-
High availability	SSO, N+1	SSO, N+1	SSO, N+1	N+1	N+1	N+1
Cisco DNA support	Automation, Assurance	Automation, Assurance	Automation, Assurance	-	-	-
mDNS gateway	Yes	Yes	Yes	-	-	-
Anchor controller	Yes	Yes	Yes	-	-	-
Foreign controller	Yes	Yes	Yes	-	-	-
Rogue detection / aWIPS	Yes	Yes	Yes	Yes	Yes	Yes
Client IPv6 support	Yes	Yes	Yes	Yes	Yes	Yes
Infrastructure IPv6 support	Yes	Yes	Yes	No	No	No

* A high-throughput profile is supported on ESXi and KVM hypervisors only.

** For traffic with large (1374 bytes) packet size.

*** Cloning from snapshots is not supported

**** vMotion, DRS, Snapshots, and vNIC Teaming not supported when SR-IOV mode is enabled.

© 2021 Cisco and/or its affiliates. All rights reserved.

Benefits

OS XE opens a completely new paradigm in network configuration, operation, and monitoring through automation. Cisco's automation solution is open, standards-based, and extensible across the entire lifecycle of a network device. The various mechanisms that bring about network automation are outlined below, based on a device lifecycle.

- **Automated device provisioning:** This is the ability to automate the process of upgrading software images and installing configuration files on Cisco access points when they are being deployed in the network for the first time. Cisco provides turnkey solutions such as Plug and Play (PnP) that enable an effortless and automated deployment.
- **API-driven configuration:** Modern wireless controllers such the Cisco Catalyst 9800-CL Wireless Controller for Cloud support a wide range of automation features and provide robust open APIs over Network Configuration Protocol (NETCONF) using YANG data models for external tools, both off-the-shelf and custom built, to automatically provision network resources.
- **Granular visibility:** Model-driven telemetry provides a mechanism to stream data from a wireless controller to a destination. The data to be streamed is driven through subscription to a data set in a YANG model. The subscribed data set is streamed out to the destination at configured intervals. Additionally, Cisco IOS XE enables the push model, which provides near-real-time monitoring of the network, leading to quick detection and rectification of failures.
- **Seamless software upgrades and patching:** To enhance OS resilience, Cisco IOS XE supports patching, which provides fixes for critical bugs and security vulnerabilities between regular maintenance releases. This support allows customers to add patches without having to wait for the next maintenance release.

Always on

- **High availability:** Stateful switchover with a 1:1 active standby and N+1 redundancy keeps your network, services, and clients always on, even in unplanned events.
- **Software Maintenance Upgrades (SMUs) with hot and cold patching:** Patching allows for a patch to be installed as a bug fix without bringing down the entire network and eliminates the need to requalify an entire software image. The SMU is a package that can be installed on a system to provide a patch fix or security resolution to a released image. SMUs allow you to address the network issue quickly while reducing the time and scope of the testing required. The Cisco IOS XE platform internally validates the SMU compatibility and does not allow you to install incompatible SMUs. All SMUs are integrated into the subsequent Cisco IOS XE Software maintenance releases.
- **Intelligent rolling access point upgrades and seamless multisite upgrades:** The Cisco Catalyst 9800-CL Wireless Controller for Cloud comes equipped with intelligent rolling access point upgrades to simplify network operations. Multisite upgrades can now be done in stages, and access points can be upgraded intelligently without restarting the entire network.

© 2021 Cisco and/or its affiliates. All rights reserved.

- **Standby monitoring of Cisco Catalyst 9800 Wireless Controllers in High-Availability (HA) mode:** This enables monitoring of the health of the system on a standby controller in a HA pair using programmatic interfaces (NETCONF/YANG, RESTCONF) and CLIs without going through the active controller. For more details refer to technical documentation .
- **In-Service Software Upgrade (ISSU):** ISSU is a complete image upgrade/update with zero downtime while the network is still on. The software image or a patch is pushed onto the wireless controller while traffic forwarding continues uninterrupted. All AP/client sessions are retained during the upgrade process.

  With just a click, your network automatically upgrades to the newest software. Your backup Catalyst 9800 controller receives the new software that is pushed via the active 9800 controller. The backup 9800 controller becomes active controller and takes over your network while your previously active 9800 turns into a backup 9800 controller and processes the software upgrade. Using an intelligent RF-based rolling access-point upgrade, all access points are upgraded in a staggered fashion, without impacting any wireless session. This procedure is carried out without any manual intervention natively from the controller, and without the need for an external orchestrator or additional licenses.

Security

- **Encrypted Traffic Analytics (ETA):** ETA is a unique capability for identifying malware in encrypted traffic coming from the access layer. Since more and more traffic is being encrypted, the visibility this feature provides related to threat detection is critical for keeping your network secure at different layers. This feature is supported on private cloud deployments only.
- **Cisco Wireless Intrusion Prevention System (WIPS):** WIPS offers advanced network security to detect, locate, mitigate, and contain any intrusion and threat on your wireless network. It can monitor and detect wireless network anomalies, unauthorized access, and RF attacks. A new dedicated classification engine for rogue and aWIPS built on Cisco DNA Center. A fully integrated stack for WIPS solution includes Cisco DNA Center, Cisco Catalyst 9800 controller, Wave2, and Catalyst 9100 Access Points. This new architecture provides improved detection and security, simplicity and ease of use, and a reduction in false-positive alarms.
- **Trustworthy systems:** Cisco Trust Anchor Technologies provide a highly secure foundation for Cisco products. With the Cisco Catalyst 9800-CL, these trustworthy systems help assure software authenticity for supply chain trust and strong mitigation against man-in-the-middle attacks on software and firmware. Trust Anchor capabilities include:
  - **Image signing:** Cryptographically signed images provide assurance that the firmware, BIOS, and other software are authentic and unmodified. As the system boots, its software signatures are checked for integrity.

© 2021 Cisco and/or its affiliates. All rights reserved.

Flexible NetFlow

- **Flexible NetFlow (FNF):** Cisco IOS FNF is the next generation in flow visibility technology, allowing optimization of the network infrastructure, reducing operating costs, and improving capacity planning and security incident detection with increased flexibility and scalability.

Application Visibility and Control

- **Next-Generation Network-Based Application Recognition (NBAR2):** NBAR2 enables advanced application classification techniques, with up to 1400 predefined and well-known application signatures and up to 150 encrypted applications on the Cisco Catalyst 9800-CL. Some of the most popular applications included are Skype, Office 365, Microsoft Lync, Cisco Webex®, and Facebook. Many others are already predefined and easy to configure. NBAR2 provides the network administrator with an important tool to identify, control, and monitor end-user application usage while helping ensure a quality user experience and securing the network from malicious attacks. It uses FNF to report application performance and activities within the network to any supported NetFlow collector, such as Cisco Prime, Stealthwatch®, or any compliant third-party tool.

Quality of service

- **Superior Quality of Service (QoS):** QoS technologies are tools and techniques for managing network resources and are considered the key enabling technologies for the transparent convergence of voice, video, and data networks. QoS on the Cisco Catalyst 9800-CL consists of classification of traffic based on packet data as well as application recognition and traffic control actions such as dropping, marking and policing. A modular QoS command-line framework provides consistent platform-independent and flexible configuration behavior. The 9800-CL, also, supports policies at two levels of target: BSSID as well as client. Policy assignment can be granular down to the client level.

Smart operation

- **WebUI:** WebUI is an embedded GUI-based device-management tool that provides the ability to provision the device, simplifying device deployment and manageability and enhancing the user experience. WebUI comes with the default image. There is no need to enable anything or install any license on the device. You can use WebUI to build a day-0 and day-1 configuration and from then on monitor and troubleshoot the device without having to know how to use the CLI.

Specifications

Table 3. Specifications

Item	Specification
Wireless standards	IEEE 802.11a, 802.11b, 802.11g, 802.11d, WMM/802.11e, 802.11h, 802.11n, 802.11k, 802.11r, 802.11u, 802.11w, 802.11ac Wave 1 and Wave 2, 802.11ax
Wired, switching, and routing standards	IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX, 1000BASE-T, 1000BASE-SX, 1000-BASE-LH, IEEE 802.1Q VLAN tagging, IEEE 802.1AX Link Aggregation

© 2021 Cisco and/or its affiliates. All rights reserved.

Item	Specification
Data standards	• RFC 768 User Datagram Protocol (UDP) • RFC 791 IP • RFC 2460 IPv6 • RFC 792 Internet Control Message Protocol (ICMP) • RFC 793 TCP • RFC 826 Address Resolution Protocol (ARP) • RFC 1122 Requirements for Internet Hosts • RFC 1519 Classless Interdomain Routing (CIDR) • RFC 1542 Bootstrap Protocol (BOOTP) • RFC 2131 Dynamic Host Configuration Protocol (DHCP) • RFC 5415 Control and Provisioning of Wireless Access Points (CAPWAP) Protocol • RFC 5416 CAPWAP Binding for 802.11
Security standards	• Wi-Fi Protected Access (WPA) • IEEE 802.11i (WPA2, RSN) • Wi-Fi Protected Access 3 (WPA3) • RFC 1321 MD5 Message-Digest Algorithm • RFC 1851 Encapsulating Security Payload (ESP) Triple DES (3DES) Transform • RFC 2104 HMAC: Keyed-Hashing for Message Authentication • RFC 2246 TLS Protocol Version 1.0 • RFC 3280 Internet X.509 Public Key Infrastructure (PKI) Certificate and Certificate Revocation List (CRL) Profile • RFC 4347 Datagram Transport Layer Security (DTLS) • RFC 5246 TLS Protocol Version 1.2
Encryption standards	• Static Wired Equivalent Privacy (WEP) RC4 40, 104 and 128 bits • Advanced Encryption Standard (AES): Cipher Block Chaining (CBC), Counter with CBC-MAC (CCM), Counter with CBC Message Authentication Code Protocol (CCMP) • Data Encryption Standard (DES): DES-CBC, 3DES • Secure Sockets Layer (SSL) and Transport Layer Security (TLS): RC4 128-bit and RSA 1024- and 2048-bit • DTLS: AES-CBC • IPsec: DES-CBC, 3DES, AES-CBC • 802.1AE MACsec encryption
Authentication, Authorization, and Accounting (AAA) standards	• IEEE 802.1X • RFC 2548 Microsoft Vendor-Specific RADIUS Attributes • RFC 2716 Point-to-Point Protocol (PPP) Extensible Authentication Protocol (EAP)-TLS • RFC 2865 RADIUS Authentication • RFC 2866 RADIUS Accounting • RFC 2867 RADIUS Tunnel Accounting • RFC 2868 RADIUS Extensions • RFC 3576 Dynamic Authorization Extensions to RADIUS • RFC 5176 Dynamic Authorization Extensions to RADIUS • RFC 3579 RADIUS Support for EAP • RFC 3580 IEEE 802.1X RADIUS Guidelines • RFC 3748 Extensible Authentication Protocol (EAP) • Web-based authentication • TACACS support for management users

© 2021 Cisco and/or its affiliates. All rights reserved.

Item	Specification
Management standards	• Simple Network Management Protocol (SNMP) v1, v2c, v3 • RFC 854 Telnet • RFC 1155 Management Information for TCP/IP-based Internets • RFC 1156 MIB • RFC 1157 SNMP • RFC 1213 SNMP MIB II • RFC 1350 Trivial File Transfer Protocol (TFTP) • RFC 1643 Ethernet MIB • RFC 2030 Simple Network Time Protocol (SNTP) • RFC 2616 HTTP • RFC 2665 Ethernet-like Interface Types MIB • RFC 2674 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and Virtual Extensions • RFC 2819 Remote Monitoring (RMON) MIB • RFC 2863 Interfaces Group MIB • RFC 3164 Syslog • RFC 3414 User-Based Security Model (USM) for SNMPv3 • RFC 3418 MIB for SNMP • RFC 3636 Definitions of Managed Objects for IEEE 802.3 MAUs • RFC 4741 Base NETCONF protocol • RFC 4742 NETCONF over SSH • RFC 6241 NETCONF • RFC 6242 NETCONF over SSH • RFC 5277 NETCONF event notifications • RFC 5717 Partial Lock Remote Procedure Call • RFC 6243 With-Defaults capability for NETCONF • RFC 6020 YANG • Cisco private MIBs
Management interfaces	• Web-based: HTTP/HTTPS • Command-line interface: Telnet, Secure Shell (SSH) Protocol, serial port • SNMP • NETCONF

Software requirements

The Cisco Catalyst 9800-CL Wireless Controller for Cloud runs on Cisco IOS XE Software version 16.10.1 or later. This software release includes all the features listed earlier in the Platform Benefits section.

Table 4. Minimum software requirements

Model	Description	Minimum software requirement
C9800-CL-K9	Cisco Catalyst 9800-CL Wireless Controller for Cloud	Cisco IOS XE Software Release 16.10.1 High-throughput profiles supported from Release 17.3.1 onward

© 2021 Cisco and/or its affiliates. All rights reserved.

Licensing

No licenses are required to boot up a **Cisco Catalyst 9800 Series Wireless Controller**. However, in order to connect any access points to the **controller**, Cisco DNA software subscriptions are required. To be entitled to connect to a Cisco Catalyst 9800 Series controller, each access point requires a Cisco DNA subscription license.

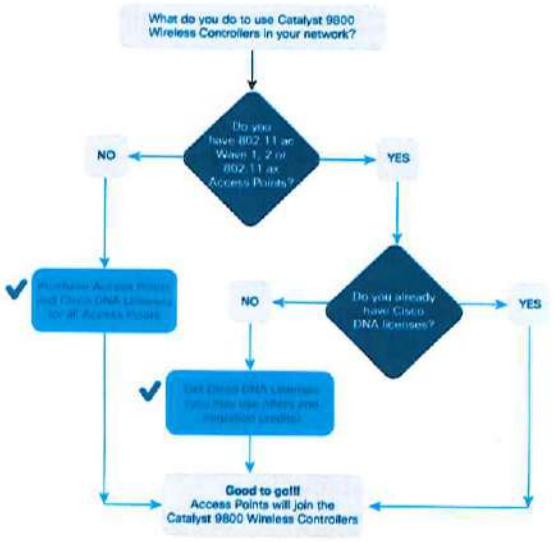


Figure 4.
Determining license requirements for access points connecting to Cisco Catalyst 9800 Series Wireless Controllers

APs connecting to Cisco Catalyst 9800 Series controllers have new and simplified software subscription packages.

They can support three tiers of Cisco DNA software: Cisco DNA Essentials, Cisco DNA Advantage, and Cisco DNA Premier.

© 2021 Cisco and/or its affiliates. All rights reserved.

Cisco DNA software subscriptions provide Cisco innovations on the AP. They also include perpetual Network Essentials and Network Advantage licensing options, which cover wireless fundamentals such as 802.1X authentication, QoS, and PnP; telemetry and visibility; and single-sign-on, as well as security controls.

Cisco DNA subscription software has to be purchased for a 3-, 5-, or 7-year subscription term. Upon expiration of the subscription, the Cisco DNA features will expire, whereas the Network Essentials and Network Advantage features will remain.

For the full feature list of Cisco DNA Software, including the perpetual Network Essentials and Network advantage, please see the feature matrix: https://www.cisco.com/c/m/en_us/products/software/dna-subscription-wireless/pn-sw-sub-matrix-wireless.html?oid=prgrw018984.

Two modes of licensing are available:

- Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more convenient way to purchase and manage software across the Cisco portfolio and across your organization. And it's secure- you control what users can access. With Smart Licensing you get:
  - Easy Activation: Smart licensing establishes a pool of software licenses that can be used across the entire organization-no more PAKs (Product Activation Keys).
  - Unified Management: My Cisco Entitlements (MCE) provides a complete view into all of your Cisco Products and services in an easy-to-use portal, so you always know what you have and what you are using.
  - License Flexibility: Your software is not node-locked to your hardware, so you can easily use and tranfer licenses as needed.

  To use Smart Licensing, you must first set up a Smart Account on Cisco Software Central (software.cisco.com).

  For more detailed overview on Cisco Licensing, go to cisco.com/go/licensingguide
- Specific License Reservation (SLR) is a feature used in highly secure networks. It provides a method for customers to deploy a software license on a device (product instance) without communicating usage information to Cisco. There is no communication with Cisco or a satellite. The licenses are reserved for every controller. It is node-based licensing.

Levels of license are supported on the **Cisco Catalyst 9800 Series Wireless Controllers.** The controllers can be configured to function at any one of the four levels.

- Cisco DNA Essentials: At this level the Cisco DNA Essentials feature set will be supported.
- Cisco DNA Advantage: At this level the Cisco DNA Advantage feature set will be supported.
- NE: At this level the Network Essentials feature set will be supported.
- NA: At this level the Network Advantage feature set will be supported.

© 2021 Cisco and/or its affiliates. All rights reserved.

Cisco DNA Premier is a bundle with ISE licenses and Cisco DNA Spaces Advantage. It is inclusive of Cisco DNA Advantage, so at this level the Cisco DNA Advantage feature set will be supported. For customers who purchase Cisco DNA Essentials, Network Essentials will be supported and will continue to function even after term expiration. And for customers who purchase Cisco DNA Advantage or Cisco DNA Premier, Network Advantage will be supported and will continue to function even after term expiration.

Initial bootup of the controller will be at the Cisco DNA Advantage level.

For questions, contact the Cisco Catalyst 9800 Series Wireless Controllers Licensing mailer group at ask-catalyst9800licensing

Managing licenses with Smart Accounts

Creating Smart Accounts by using the Cisco Smart Software Manager (SSM) enables you to order devices and licensing packages and also manage your software licenses from a centralized website. You can set up the Smart Account to receive daily email alerts and to be notified of expiring add-on licenses that you want to renew. A Smart Account is mandatory for Cisco Catalyst 9800 Series controllers. For more information on Smart Accounts, refer to https://www.cisco.com/go/smartaccounts.

Warranty

Find warranty information on Cisco.com at the Product Warranties page.

Your embedded software is subject to the Cisco EULA (link available below) and/or any SEULA or specific software warranty terms for additional software products loaded on the device.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in Table 5.

Table 5. Links to sustainability information

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance
Sustainability inquiries	Contact: csr_inquiries@cisco.com

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

© 2021 Cisco and/or its affiliates. All rights reserved.

Ordering information

Table 6. Ordering information

	Product ID	Description
Controller	C9800-CL-K9	Cisco Catalyst 9800-CL Wireless Controller for Cloud
	LIC-C9800-DTLS-K9	Cisco Catalyst 9800 Series Wireless Controller DTLS license

- Purchase the above SKU for software download and Cisco TAC support.
- The 9800-CL private cloud image for VMware ESXi, KVM, Hyper-V, and Cisco NFVIS on ENCS can be downloaded from software.cisco.com.
- The 9800-CL public cloud image for AWS can be subscribed and deployed from the AWS Marketplace.
- The 9800-CL public cloud image for GCP can be subscribed and deployed from the GCP Marketplace.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital® makes it easier to get the right technology to achieve your objectives, enable business transformation, and stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

© 2021 Cisco and/or its affiliates. All rights reserved.

Document history

New or revised topic	Described in	Date
Cosmetic changes to various tables were made	Table 1, 2	November 15, 2018
Updated images were included	Image	November 15, 2018
Licensing information updated	Licensing	December xx, 2018

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 https://www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to the URL: https://www.cisco.com/go/trademarks. Third party trademarks mentioned 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. (1110R)

Printed in USA

C78-741564-06 08/21

© 2021 Cisco and/or its affiliates. All rights reserved.

Cisco IP Phone 7800 Series

© 2020 Cisco and/or its affiliates. All rights reserved.

Contents

© 2020 Cisco and/or its affiliates. All rights reserved.

The Cisco® IP Phone 7800 Series is a cost-effective, high-fidelity voice communications portfolio designed to improve your organization's people-centric communications, while reducing your operating costs.

It combines an attractive new ergonomic design with "always-on" reliability and secure encrypted communications. The Cisco® IP Phone 7800 Series delivers advanced IP Telephony features and crystal clear wideband audio performance to deliver an easy-to-use, full-featured voice communications experience on Cisco on-premises and hosted infrastructure platforms and third party hosted call control.

The Cisco® IP Phone 7800 Series introduces four models to the Cisco IP Phone portfolio. From left-to-right (Figure 1), they are:

- Cisco IP Phone 7811 supporting one line (available in charcoal only)
- Cisco IP Phone 7821 supporting two lines (available in charcoal and white)
- Cisco IP Phone 7841 supporting four lines (available in charcoal and white)
- Cisco IP Phone 7861 supporting sixteen lines (available in charcoal and white)

Figure 1.
Cisco IP Phone 7800 Series

© 2020 Cisco and/or its affiliates. All rights reserved.

The line keys on each model are fully programmable. You can set up keys to support either lines, such as directory numbers, or call features like speed dialing. You can also boost productivity by handling multiple calls for each directory number, using the multi-call per-line appearance feature. Tri-color LEDs on the line keys support this feature and make the phone simpler and easy to use.

Fixed function keys on all models give you one-touch access to service, messaging, directory, hold/resume, transfer, and conference features. A full-duplex speakerphone lets you set up clear multi-party conferences for flexible, productive collaboration.

The Cisco IP Phone 7800 Series sets a new standard in usability and delivers a context-sensitive user experience. It features a high-resolution 3.5" (396x162) greyscale display with white backlighting on the IP Phone 7821, 7841 and 7861, and a 3.2" (384 x106) display without backlighting on IP Phone 7811, for easy reading. Localized language support, including right-to-left onscreen text, meets the needs of global users.

The Cisco IP Phone 7800 Series is also more energy-efficient and eco-friendly, to support your green initiatives. Each phone supports Power-over-Ethernet (PoE) Class 1 and Cisco's EnergyWise™, and is Energy Star certified. A standard power-save option is available on the IP Phone 7821, 7841 and 7861 to reduce power consumption during off-hours, save money and maximize energy efficiency.

The IP Phone 7800 Series portfolio is ideal for any mid-sized to large enterprise company that wants to update its phone system from a traditional analog or digital-based system to an IP Communications system. It's also an excellent choice if you're seeking to expand your voice communications support with your current Cisco Unified Communications solution. Small businesses who have interest in the Cisco IP Phone 7800 Series, but have investment in or are considering third party hosted call control services, are also candidates for the IP Phone 7800 Series.

Features and benefits

Table 1 lists features and benefits of the Cisco® IP Phone 7800 Series.

Table 1. Features and benefits

Features	Benefits
Hardware Features	
Ergonomic design	• The phone offers an easy-to-use interface and provides a traditional telephony-like user experience.
Graphical display	• White backlit, greyscale, 3.5" 396×162 pixel-based display on the IP Phone 7821, 7841 and 7861. • Non-backlit, greyscale, 3.2" 384×106 pixel-based display on the IP Phone 7811. • Provide scrollable access to calling features and text-based XML applications.
Handset	• The handset is a standard wideband-capable audio handset (connects through an RJ-9 port) for the IP Phone 7821, 7841 and 7861. • The default handset is a standard narrowband-capable audio handset (connects through an RJ-9 port) for the IP Phone 7811, and wideband on handset is available with purchase of additional wideband handset. • The handset is Hearing Aid-Compatible (HAC) and meets Federal Communications Commission (FCC) loudness requirements for the Americans with Disabilities Act (ADA). You can achieve Section 508 loudness requirements by using industry-standard inline handset amplifiers such as Walker Equipment W-10 or CE-100 amplifiers. The dial pad is also ADA-compliant. • The narrowband handset (for the IP Phone 7811) produces a magnetic field that attracts small metallic objects such as pins and staples. To avoid possible injuries do not keep small metallic objects close to the handset.

© 2020 Cisco and/or its affiliates. All rights reserved.

Features	Benefits
Headset	• The analog headset jack is a standard wideband-capable RJ-9 audio port for the IP Phone 7821, 7841, and 7861.
Backlit indicator	• The phone supports backlit indicators for the audio path keys (handset, headset and speakerphone), select key, line keys, and message waiting. • Headset key is not available on the IP Phone 7811.
Volume control	• A volume-control toggle provides easy decibel-level adjustments of the handset, monitor speaker, and ringer.
Full duplex speakerphone	• Full-duplex speakerphone allows gives you flexibility in placing and receiving calls. For added security, the audible Dual Tone Multifrequency (DTMF) tones are masked when the speakerphone mode is used.
Bezel	• The IP Phone 7821, 7841 and 7861 include a default black bezel (replaceable), and an optional silver bezel is also available separately. • The IP Phone 7811 is available with a black bezel.
Dual-position foot stand	• The display is easy to view and the buttons and keys are easy to use. The two-position foot stand supports viewing angles of 30 degrees and 45 degrees; you can remove the foot stand for wall mounting, with mounting holes located on the base of the phone. (IP Phone 7821, 7841 and 7861) • Only 1 foot-stand position (45 degrees) is supported on the IP Phone 7811.
Wall-mountable	• The phone can be installed on a wall using optional wall-mount kit (available separately).
Electronic hook switch	• The hookswitch can be controlled electronically with a third party headset connected to the auxiliary port for the IP Phone 7821, 7841, and 7861.
Keys	• The phone has the following keys ◦ Line keys ◦ Soft-keys ◦ Two-way navigation and select keys ◦ Hold/Resume, Transfer and Conference keys ◦ Messaging, Service and Directory keys ◦ Standard key pads ◦ Volume control toggle key ◦ Speakerphone, headset and mute keys (Headset key is not available on the IP Phone 7811)
Ethernet cables	• The IP Phone 7811, 7821, 7841, and 7861 ◦ Category 3/5/5e/6 for 10-Mbps cables with 4 pairs ◦ Category 5/5e/6 for 100-Mbps cables with 4 pairs • The IP Phone 7841 ◦ Category 5/5e/6 for 1000-Mbps cables with 4 pairs
Power Features	
IEEE PoE class 1	• The phone supports IEEE 802.3af PoE (Class 1); power consumption does not exceed 3.84 watts.
AC Power Adapter	• Cisco power cube 3 (CP-PWR-CUBE-3=) and Cisco power adapter 3 (CP-PWR-ADPT-3) are used as standard Cisco IP Phone Power Supplies for non-PoE deployments.
Cisco power injector	• The IP Phone 7811, 7821 and 7861 are compatible with Cisco Unified IP Phone Power Injector (CP-PWR-INJ), and 7841 is compatible with Cisco Aironet Power Injector (AIR-PWRINJ5=).

© 2020 Cisco and/or its affiliates. All rights reserved.

Features	Benefits
Call-Control Support	
Cisco Unified Communications Manager	• 8.5.1 • 8.6.2 • 9.1.2 • 10.x and later
Cisco Business Edition 6000	• 8.6.2 • 9.1.2 • 10.x and later
Cisco Hosted Collaboration Solution	• 8.6.2 and later (using supported UCM versions above)
Cisco Unified Survivable Remote Site Telephony	• 8.x and later

Licensing

The Cisco IP Phone 7811 and 7821 require a Basic User Connect License (UCL) in order to connect to Cisco Unified Communications Manager. The Cisco IP Phone 7841 and 7861 require an Enhanced User Connect License (UCL) in order to connect to Cisco Unified Communications Manager.

Product specifications

Table 2 lists the features and specifications of The Cisco® IP Phone 7800 Series.

Table 2. Features and specifications

Features	Specifications
Signaling protocol support	• Session Initiation Protocol (SIP)
Codec support	• G.711a/μ, G.722, G.729a, iLBC
Key call features support	• + Dialing (E.164) • Abbreviated dial • Adjustable ringing and volume levels • Adjustable display contrast • Agent greeting • Auto-answer • Auto-detection of headset (Not available on the IP Phone 7811) • Busy Lamp Field (BLF) (Not available on the IP Phone 7811) • Call back • Call forward • Call history • Call park • Call Pickup • Call timer • Call waiting • Caller ID

© 2020 Cisco and/or its affiliates. All rights reserved.

Features	Specifications
	• charge • Corporate directory • Conference • Cross Cluster Extension Mobility (EMCC) • Dial from the list • Direct transfer • Do not disturb • Extension Mobility (EM) • Forced access codes and client matter codes • Group call pickup • Hold/resume • Immediate divert • Intercom (Not available on the IP Phone 7811) • Join (Not available on the IP Phone 7811) • Message-waiting indicator • Meet me conference • Mobility • Music on hold • Mute • Network profiles (automatic) • On- and off-network distinctive ringing • Personal directory • Privacy • Private Line Automated Ringdown (PLAR) • Redial • Ring tone per line appearance • Shared line • Silent monitoring and recording • Speed dial • Time and date display • Transfer • Voicemail • Whisper coaching
Language support	• Arabic (Arabic Area) • Bulgarian (Bulgaria) • Catalan (Spain) • Chinese (China) – GB 2312 • Chinese (Hong Kong) • Chinese (Taiwan) • Croatian (Croatia) • Czech (Czech Republic) • Danish (Denmark) • Dutch (Netherlands) • English (United Kingdom) • Estonian (Estonia)

© 2020 Cisco and/or its affiliates. All rights reserved.

Features	Specifications
	• French (France) • Finnish (Finland) • German (Germany) • Greek (Greece) • Hebrew (Israel) • Hungarian (Hungary) • Italian (Italy) • Japanese (Japan) • Latvian (Latvia) • Lithuanian (Lithuania) • Korean (Korea Republic) • Norwegian (Norway) • Polish (Poland) • Portuguese (Portugal) • Portuguese (Brazil) • Romanian (Romania) • Russian (Russian Federation) • Spanish (Columbia) • Spanish (Spain) • Slovak (Slovakia) • Swedish (Sweden) • Serbian (Republic of Serbia) • Serbian (Republic of Montenegro) • Slovenian (Slovenia) • Thai (Thailand) • Turkish (Turkey)
Multiple ring tones	• The phone supports user-adjustable ring tones.
Directories	• The phone identifies incoming messages and categorizes them for users on the screen. This makes it fast and easy to return calls using direct dial-back capability. The corporate directory integrates with the Lightweight Directory Access Protocol (LDAP) standard directory.
Quality-of-service (QoS) options	• The phone supports CDP and 802.1Q/p standards, and can be configured with an 802.1Q VLAN header containing the VLAN ID overrides configured by the Admin VLAN ID.
Security	• Certificates • Image authentication • Device authentication • File authentication • Signaling authentication • Media encryption using Secure Real-Time Transfer Protocol (SRTP) using AES-128 • Signaling encryption using Transport Layer Security (TLS) Protocol using AES-128 or A... • Encrypted configuration files • 802.1X authentication • Cryptography
Configuration options	• The user can configure IP address assignment statically or through the DHCP client.
Physical dimensions	• IP Phone 7811: 207 x 195 x 33mm (exclude foot stand)

© 2020 Cisco and/or its affiliates. All rights reserved.

Features	Specifications
(H×W×D)	• IP Phone 7821: 207 x 205 x 28mm (exclude foot stand) • IP Phone 7841: 207 x 205 x 28mm (exclude foot stand) • IP Phone 7861: 207 x 205 x 28mm (exclude foot stand)
Weight	• IP Phone 7811: 806g • IP Phone 7821: 867g • IP Phone 7841: 868g • IP Phone 7861: 1053g
Display	• IP Phone 7821, 7841, 7861: 3.5" 396×162 pixels • IP Phone 7811: 3.28" 384×106 pixels
Ethernet switch	• The phone has a 10/100BASE-T (The Cisco® IP Phone 7811, 7821 and 7861) or a10/100/1000BASE-T (The Cisco® IP Phone 7841) Ethernet connection through two RJ-45 ports, one for the LAN connection and the other for a downstream Ethernet device connection like a PC.
Phone casing composition	• Polycarbonate Acrylonitrile Butadiene Styrene (ABS) textured plastic.
Power requirements	• The phone is an interoperable IEEE 802.3af PoE (Class 1 device); 48 VDC is required; it can be supplied locally at the desktop using an optional AC-to-DC power supply (CP-PWR-CUBE-3=). Use of the power supply also requires the use of one of the corresponding AC country cords.
Operational temperature	• 32 to 104°F (0 to 40°C)
Nonoperational temperature shock	• 14 to 140°F (-10 to 60°C)
Humidity	• Operating 10% to 90%, non-condensing • Non-operating 10% to 95%, non-condensing
Cosmetic	• Cisco cosmetic class A
Certification and compliance	• Regulatory Compliance - CE Markings per directives 2004/108/EC and 2006/95/EC • Safety - UL 60950 Second Edition - CAN/CSA-C22.2 No. 60950 Second Edition - EN 60950 Second Edition (including A11 and A12) - IEC 60950 Second Edition (including A11 and A12) - AS/NZS 60950 - GS4943 • EMC - Emissions - 47CFR Part 15 (CFR 47) Class B - AS/NZS CISPR22 Class B - CISPR22: 2005 w/Amendment 1: 2005 Class B - EN55022: 2006 w/Amendment 1: 2007 Class B - ICES003 Class B - VCCI Class B - EN61000-3-2 - EN61000-3-3 - KN22 Class B • EMC - Immunity

© 2020 Cisco and/or its affiliates. All rights reserved.

25

Features	Specifications
	- EN55024 - CISPR24 - EN60601-1-2 - KN24 - Airmedito Light • Telecom - FCC Part 68 HAC - CS-03-HAC - AS/ACIF S004 - AS/ACIF S040 - NZ PTC 220 - Industry Standards: TIA 810 and TIA 920 - Industry Standards: IEEE 802.3 Ethernet, IEEE 802.3af and 802.3at

Ordering information

Table 3 gives ordering information for the phone and its accessories.

Table 3. Ordering Information

Product Number	Description
CP-7811-K9=	• Cisco IP Phone 7811
CP-7821-K9=	• Cisco IP Phone 7821
CP-7841-K9=	• Cisco IP Phone 7841
CP-7861-K9=	• Cisco IP Phone 7861
CP-7821-W-K9=	• Cisco IP Phone 7821, White
CP-7841-W-K9=	• Cisco IP Phone 7841, White
CP-7861-W-K9=	• Cisco IP Phone 7861, White
CP-DX-HS-NB=	• Spare Narrowband Handset for Cisco IP Phone 7811
CP-DX-HS=	• Spare Wideband Handset for Cisco IP Phone 7800 Series
CP-DX-W-HS=	• Spare White Wideband Handset for Cisco IP Phone 7800 Series
CP-7800-HS-CORD=	• Spare Handset Cord for Cisco IP Phone 7800 Series
CP-DX-W-CORD=	• Spare White Handset Cord for Cisco IP Phone 7800 Series
CP-7800-HS-HOOK=	• Spare Handset Hook for Cisco IP Phone 7800 Series, 20 Pieces
CP-7811-WMK=	• Spare Wallmount Kit for Cisco IP Phone 7811
CP-7800-WMK=	• Spare Wallmount Kit for Cisco IP Phone 7800 Series

© 2020 Cisco and/or its affiliates. All rights reserved.

Product Number	Description
CP-7861-WMK=	• Spare Wallmount Kit for Cisco IP Phone 7861
CP-7811-FS=	• Spare Foot stand for Cisco IP Phone 7811
C[illegible]00-FS=	• Spare Foot stand for Cisco IP Phone 7800 Series
C[illegible]1-FS=	• Spare Foot stand for Cisco IP Phone 7861
CP-7821-B-BEZEL=	• Spare Black Bezel for Cisco IP Phone 7821
CP-7821-S-BEZEL=	• Spare Silver Bezel for Cisco IP Phone 7821
CP-7841-B-BEZEL=	• Spare Black Bezel for Cisco IP Phone 7841
CP-7841-S-BEZEL=	• Spare Silver Bezel for Cisco IP Phone 7841
CP-7861-B-BEZEL=	• Spare Black Bezel for Cisco IP Phone 7861
CP-7861-S-BEZEL=	• Spare Silver Bezel for Cisco IP Phone 7861
CP-PWR-CUBE-3	• Cisco Power Cube 3
CP-PWR-CORD-AP=	• Power Cord Asia Pacific
CP-PWR-CORD-AR=	• Power Cord Argentina
CP-PWR-CORD-AU=	• Power Cord Australia
CP-PWR-CORD-BZ=	• Power cord for Brazil
CP-PWR-CORD-CE=	• Power Cord European
CP-PWR-CORD-CN=	• Power Cord China
CP-PWR-CORD-JP=	• Power Cord Japan
CP-PWR-CORD-NA=	• Power Cord North America
CP-PWR-CORD-SW=	• Power Cord Switzerland
CP-PWR-CORD-UK=	• Power Cord United Kingdom
CP-PWR-ADPT-3-AR=	• Cisco Power Adapter 3 with Argentina Clip
CP-[illegible]WR-ADPT-3-AU=	• Cisco Power Adapter 3 with Australia Clip
[illegible]R-ADPT-3-BZ=	• Cisco Power Adapter 3 with Brazil Clip
CP-PWR-ADPT-3-CN=	• Cisco Power Adapter 3 with China Clip
CP-PWR-ADPT-3-EU=	• Cisco Power Adapter 3 with European Clip
CP-PWR-ADPT-3-IN=	• Cisco Power Adapter 3 with India Clip

© 2020 Cisco and/or its affiliates. All rights reserved.

Product Number	Description
CP-PWR-ADPT-3-KR=	• Cisco Power Adapter 3 with Korea Clip
CP-PWR-ADPT-3-NA=	• Cisco Power Adapter 3 with North America Clip
CP-PWR-ADPT-3-UK=	• Cisco Power Adapter 3 with United Kingdom Clip

Warranty

The Cisco® IP Phone 7800 Series are covered by a Cisco standard 1-year replacement warranty.

Cisco Unified Communications Services

Cisco and our certified partners can help you set up a secure, dependable Cisco Unified Communications solution, meeting aggressive deployment schedules and accelerating business advantage. Cisco's portfolio of services is based on proven methodologies for unifying voice, video, data, and mobile applications on fixed and mobile networks.

Our unique lifecycle approach to services defines what's needed at each phase of the solution lifecycle. Customized planning and design services help you create a solution that meets your business needs. Award-winning technical support helps you boost your operational efficiency. Remote management services simplify day-to-day operations. And optimization services let you modify and improve your network solution when business needs change.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire

© 2020 Cisco and/or its affiliates. All rights reserved.

hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

More information

For additional details on the Cisco™ IP Phone 7800 Series, go to https://www.cisco.com/go/ipphones/7800.

American 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 https://www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: https://www.cisco.com/go/trademarks. Third-party trademarks mentioned 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. (1110R)

Printed in USA C78-729488-13 06/20

© 2020 Cisco and/or its affiliates. All rights reserved.

CISCO
SECURE

Data sheet
Cisco public

Cisco Identity Services Engine

© 2020 Cisco and/or its affiliates. All rights reserved.

Contents

© 2020 Cisco and/or its affiliates. All rights reserved.

26
Teletex

The Cisco® Identity Services Engine (ISE) is your one-stop solution to streamline security policy management and reduce operating costs. With ISE, you can see users and devices controlling access across wired, wireless, and VPN connections to the corporate network.

Product overview

Cisco ISE allows you to provide highly secure network access to users and devices. It helps you gain visibility into what is happening in your network, such as who is connected, which applications are installed and running, and much more. It also shares vital contextual data, such as user and device identities, threats, and vulnerabilities with integrated solutions from Cisco technology partners, so you can identify, contain, and remediate threats faster.

Customer advantages

Cisco ISE offers a holistic approach to network access security. You gain many advantages when ISE is deployed, including:

Highly secure business and context-based access based on your company policies. ISE works with network devices to create an all-encompassing contextual identity with attributes such as user, time, location, threat, vulnerability, and access type. This identity can be used to enforce a highly secure access policy that matches the identity's business role. IT administrators can apply precise controls over who, what, when, where, and how endpoints are allowed on the network. ISE uses multiple mechanisms to enforce policy, including Cisco TrustSec® software-defined segmentation.

Streamlined network visibility through a simple, flexible, and highly consumable interface. ISE stores a detailed attribute history of all the endpoints that connect to the network as well as users (including types such as guest, employee, and contractors) on the network, all the way down to endpoint application details and firewall status.

Extensive policy enforcement that defines easy, flexible access rules that meet your ever-changing business requirements. All controlled from a central location that distributes enforcement across the entire network and security infrastructure. IT administrators can centrally define a policy that differentiates guests from registered users and devices. Regardless of their location, users and endpoints are allowed access based on role and policy. Cisco TrustSec Security Group Tags (SGT) allow organizations to base access control on business rules and not IP addresses or network hierarchy. These SGTs give users and endpoints access, on a least privilege policy, that is constantly maintained as resources move across domains. Managing switch, router, and firewall rules becomes easier and has shown to help reduce IT Operations by 80% and increase time to implement changes by 98%.

Robust guest experiences that provide multiple levels of access to your network. You can provide guest access through a coffee-shop-type hotspot access, self-service registered access, or sponsored access. ISE provides you with the ability to highly customize various guest portals through an on-box or cloud-delivered portal editor that provides dynamic visual tools. You can see real-time previews of the portal screen and the experience a guest would have connecting to the network.

Self-service device onboarding for the enterprise's Bring-Your-Own-Device (BYOD) or guest policies. Users can manage devices according to the business policies defined by IT administrators. The IT staff will have the automated device provisioning, profiling, and posturing needed to comply with security policies. At the same time, employees can get their devices onto the network without requiring IT assistance.

© 2020 Cisco and/or its affiliates. All rights reserved.

Cisco DNA Center Integration

Cisco DNA Center is the foundational controller and analytics platform at the heart of Cisco's Intent based Network. Cisco DNA Center simplifies network management and allows one to quickly set up various ISE services such as Guest and BYOD quickly and easily throughout the network, Cisco DNA Center also makes it easy to design, provision, and apply policy in minutes, not days across the network. Analytics and assurance use network insights to optimize network performance. Cisco DNA Center integrates with ISE 2.3 or later using pxGrid to deploy group based secure access and network segmentation based on business needs. With Cisco Cisco DNA Center and ISE, policy can be applied to users and applications instead of to the network devices. Group Based Policy provides software-defined segmentation to control network access, enforce security policies, and meet compliance requirements.

Automated device-compliance checks for device-posture and remediation options using the Cisco AnyConnect® Unified Agent. The AnyConnect® agent also provides advanced VPN services for desktop and laptop checks. ISE also integrates with market-leading Mobile Device Management/Enterprise Mobility Management (MDM/EMM) vendors. MDM integration helps ensure that a mobile device is both secure and policy compliant before it is given access to the network.

The ability to share user and device details throughout the network. Cisco pxGrid (Platform Exchange Grid) technology is a robust platform that you can use to share a deep level of contextual data about connected users and devices with Cisco and Cisco Security Technical Alliance solutions. ISE's network and security partners use this data to improve their own network access capabilities and accelerate their ability to identify, mitigate, and rapidly contain threats.

Central network device management using TACACS+. Cisco ISE allows you to manage network devices using the TACACS+ security protocol to control and audit the configuration of network devices. ISE facilitates granular control of who can access which network device and change the associated network settings.

Features and benefits

Cisco ISE empowers organizations in a number of ways, as shown in Table 1.

Table 1. Features and benefits

Feature	Benefit
Centralized management	• Helps administrators centrally configure and manage profiler, posture, guest, authentication, and authorization services in a single web-based GUI console. • Simplifies administration by providing integrated management services from a single pane of glass.
Rich contextual identity and business-policy	• Provides a rule-based, attribute-driven policy model for flexible and business-relevant access control policies. • Includes attributes such as user and endpoint identity, posture validation, authentication protocols, device identity, and other external attributes. These attributes can be created dynamically and saved for later use. • Integrates with multiple external identity repositories such as Microsoft Active Directory, Lightweight Directory Access Protocol (LDAP), RADIUS, RSA One-Time Password (OTP), certificate authorities for both authentication and authorization, Open Database Connectivity (ODBC) and SAML providers.
Access control	• Provides a range of access control options, including downloadable Access Control Lists (dACLs), Virtual LAN (VLAN) assignments, URL redirections, named ACLs, and Security Group ACLs (SGACLs) with Cisco TrustSec technology.
Secure supplicant-less network access with Easy Connect	• Provides the ability to swiftly roll out highly secure network access By deriving authentication and authorization from login information across application layers, allowing user access without requiring an 802.1X supplicant to exist on the endpoint.

© 2020 Cisco and/or its affiliates. All rights reserved.

Feature	Benefit
Cisco TrustSec / Group Based Policy	• Cisco Group Based Policy / TrustSec software-defined segmentation provides simpler segmentation through the use of Security Group Tags (SGT). It is an open technology in IETF, available within OpenDaylight, and supported on third-party and Cisco platforms. • ISE is the Segmentation controller which simplifies the management of switch, router, wireless, and firewall rules. • Group information propagates SGTs across network devices in the data path (inline tagging) or via Security group tag exchange protocol (SXP) IP-to-SGT binding information where devices do not have the capability to tag packets with SGTs.
Guest lifecycle management	• Provides a streamlined experience for implementing and customizing guest network access. • Creates corporate-branded guest experiences with advertisements and promotions in minutes. Support is built in for hotspot, sponsored, self-service, and numerous other access workflows. • Provides the administration with real-time visual flows that bring the effects of the guest flow design to life. • Tracks access across the network for security, compliance, and full guest auditing. Time limits, account expirations, and SMS verification offer additional security controls. • Streamlines access so guests can use their social media credentials to connect.
Streamlined device onboarding	• Automates supplicant provision and certificate enrollment for standard PC and mobile computing platforms. Provides more secure access, reduces IT help desk tickets, and delivers a better experience to users. • Enables end users to add and manage their devices with self-service portals and supports SAML 2.0 for web portals. • Integrates with MDM/EMM vendors for mobile device compliancy and enrollment.
Built-in AAA services	• Uses standard RADIUS protocol for Authentication, Authorization, and Accounting (AAA). • Supports a wide range of authentication protocols, including, but not limited to PAP, MS-CHAP, Extensible Authentication Protocol (EAP)-MD5, Protected EAP (PEAP), EAP-Flexible Authentication via Secure Tunneling (FAST), EAP-Transport Layer Security (TLS), and EAP-Tunneled Transport Layer Security (TTLS). Note: Cisco ISE is the only RADIUS server to support EAP chaining of machine and user credentials.
Device administration access control and auditing	• Supports the TACACS+ protocol • Grants users access based on credentials, group, location, and commands. • Provides access to device configuration on a need-to-know and need-to-act basis while keeping audit trails for every change in the network.
Internal certificate authority	• Offers an easy-to-deploy internal certificate authority. • Provides a single console to manage endpoints and certificates. Certificate status is checked through the standards-based Online Certificate Status Protocol (OCSP). Certificate revocation is automatic. • Supports standalone deployments, products integrated on pxGrid, and subordinate ones (that is, ones in which the certificate authority is integrated with your existing enterprise public key infrastructure, or PKI). • Facilitates the manual creation of bulk or single certificates and key pairs to connect devices to the network with a high degree of security.
Device profiling	• Populated with predefined device templates for many types of endpoints, such as IP phones, printers, IP cameras, smartphones, and tablets, with additional device templates available for specialized devices such as medical, manufacturing, and building automation. • Creates custom device templates to automatically detect, classify, and associate administration-defined identities when endpoints connect to the network. • Associates endpoint-specific authorization policies based on device type. • Collects endpoint attribute data with passive network monitoring and telemetry.

© 2020 Cisco and/or its affiliates. All rights reserved.

Feature	Benefit
Device-profile feed service	• Delivers automatic updates of Cisco's validated device profiles for various IP-enabled devices from multiple vendors. Simplifies the task of keeping an up-to-date library of the newest IP-enabled devices. • Gives partners and customers the ability to share customized profile information to be vetted by Cisco and redistributed.

Endpoint posture service	• Performs posture assessments to endpoints connected to the network.
	• Enforces the appropriate compliance policies for endpoints through a persistent client-based agent, a temporal agent, or a query to an external MDM/EMM.
	• Provides the ability to create powerful policies that include, but are not limited to, checks for the latest OS patch, antivirus and antispyware packages with current definition file variables (version, date, etc.), antimalware packages, registry settings (key, value, etc.), patch management, disk encryption, mobile PIN-lock, rooted or jailbroken status, application presence, and USB-attached media.
	• Supports automatic remediation of PC clients as well as periodic reassessments alongside leading enterprise patch-management systems to make sure the endpoint is not in violation of company policies.
	• Provides hardware inventory for full network visibility.
	• Requires the AnyConnect 4.x agent for posture assessment on these OS platforms:
	  ◦ Windows 10, 8.1, 8, and 7
	  ◦ Mac OS X 10.8 and later

Extensive multiforest Active Directory support	• Provides comprehensive authentication and authorization against multiforest Microsoft Active Directory domains. • Groups multiple, disjointed domains into logical groups. • Includes flexible identity rewriting rules to smooth the solution's transition and integration. • Supports Microsoft Active Directory 2003, 2008, 2008R2, 2012, 2012R2, and 2016.
Monitoring and troubleshooting	• Offers a built-in help web console for monitoring, reporting, and troubleshooting. • Provides robust historical and real-time reporting for all services. Logs all activity and offers real-time dashboard metrics of all users and endpoints connecting to the network.
Certifications	• Meets the requirements of Federal Information Processing Standard (FIPS) 140-2, Common Criteria, and Unified Capabilities Approved Product List. • IPv6 ready. **Note:** Certifications may not be available on all releases or they may be in varying states of approval. Current certifications and releases can be found at Global Government Certifications.
Upgrade Readiness Tool (URT)	• Runs pre-upgrade checks • Simulates an actual upgrade • Provides guidance on upgrade success/failure • Provide guidance on upgrade time per node • Constantly Updated & Learning
IPv6 Support	• IPv6 for RADIUS and TACACS+ based network devices. • ISE can be managed via IPv6 management network. This includes: Connecting to ISE management interface (Web or CLI),Connecting to Active Directory, Sending syslog messages, Sending SNMP traps, REST API over IPv6, DNS resolution and NTP time synchronization.

© 2020 Cisco and/or its affiliates. All rights reserved.

22

Integrated solutions

Cisco pxGrid is a highly scalable IT clearinghouse for multiple security tools to communicate automatically with each other in real time. With Cisco ISE 2.4 we introduce pxGrid 2.0, which provides a new WebSockets client and removes dependencies on underlying operating systems and languages. More than 50 integrations are available from Cisco and third-party vendors, notably Cisco Industrial Network Director (IND), which uses pxGrid to provide OT endpoint information to ISE. Additionally, pxGrid is used to share IP-to-SGT information about endpoints allowing security products to apply Security Group access control using SGTs.

Cisco Rapid Threat Containment simplifies and automates network mitigation and investigation actions in response to security events. It integrates Cisco ISE and Cisco security technology partner solutions in a broad variety of technology areas. With Threat-Centric Network Access Control (TC-NAC), it can change user access based on CVSS vulnerability and STIX threat scores. With the Cisco pxGrid Adaptive Network Control (ANC), it gives you the ability to reset the network access status of an endpoint to quarantine, unquarantine, bounce, or shut down a port.

Platform support and compatibility

ISE is available as a physical or virtual appliance. Both physical and virtual deployments can be used to create ISE clusters that can provide the scale, redundancy, and failover requirements of a critical enterprise network.

ISE virtual appliances are supported on VMware ESXi 5.x and 6.x, KVM on Red Hat 7.x, and Microsoft Hyper-V on Microsoft Windows Server 2012R2 and later.

For ISE physical appliance details please refer to the Cisco Secure Network Server datasheet.

Licensing overview

As seen in Figure 1, four primary ISE licenses are available. With this flexible model, you can select the number and combination of licenses to get the set of features you want.

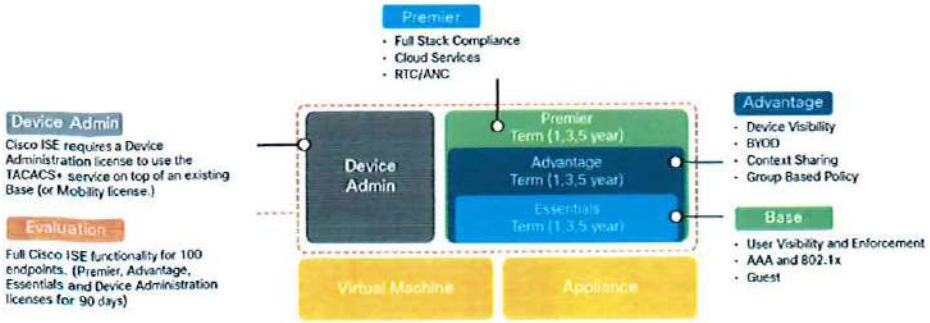


Figure 1.
Cisco ISE license packages

© 2020 Cisco and/or its affiliates. All rights reserved.

Ordering information

The Cisco ISE ordering guide will help you understand the different models and licensing types to make the best use of your ISE deployment. To place an order, visit the Cisco ordering homepage. To download the ISE software, visit the Cisco Software Center.

Service and support

Cisco offers a wide range of service programs. These innovative programs are delivered through a combination of people, processes, tools, and partners that results in high levels of customer satisfaction. Cisco Services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, see Cisco Technical Support Services or Cisco Security Services.

Warranty information can be found here.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

How to buy

To view buying options and speak with a Cisco sales representative, visit https://www.cisco.com/c/en/us/buy.html

For more information

For more information about the Cisco ISE solution, visit https://www.cisco.com/c/en/us/products/security/identity-services-engine/index.html or contact your local account representative.

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 https://www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: https://www.cisco.com/go/trademarks. Third party trademarks mentioned 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. (1110R)

© 2020 Cisco and/or its affiliates. All rights reserved.

Wi-Fi CERTIFIED™ Certificate

This certificate lists the features that have successfully completed Wi-Fi Alliance interoperability testing. Learn more: www.wi-fi.org/certification/programs

Certification ID: WFA98114

Product Info

Date of Certification	December 7, 2020
Company	Cisco Systems
Product Name	Cisco Catalyst 9800 Cloud Wireless Controller and Cisco C9115AX AP
Product Model Variant	2020-12-01
Model Number	C9800-CL and C9115AX
Category	Routers
Sub-category	Enterprise/Service Provider Access Point, Switch/Controller or Router

Summary of Certifications

CLASSIFICATION	CERTIFICATION
Connectivity	2.4 GHz Spectrum Capabilities 5 GHz Spectrum Capabilities Wi-Fi CERTIFIED 6™ Wi-Fi CERTIFIED™ a Wi-Fi CERTIFIED™ ac Wi-Fi CERTIFIED™ b Wi-Fi CERTIFIED™ g Wi-Fi CERTIFIED™ n Wi-Fi Enhanced Open™ 2020-02
Optimization	WMM® WMM®-Power Save Wi-Fi Agile Multiband™
Security	Protected Management Frames WPA2™-Enterprise 2018-04 WPA2™-Personal 2020-02 WPA3™-Enterprise 2020-02 WPA3™-Personal 2020-02 WPA™-Enterprise WPA™-Personal

Wi-Fi CERTIFIED™ Certificate

Certification ID: WFA98114

Summary of Certifications (continued)

CLASSIFICATION	CERTIFICATION
Spectrum & Regulatory Features	Spectrum & Regulatory

Wi-Fi CERTIFIED™ Certificate

Certification ID: WFA98114

Role: Access Point

Wi-Fi Components

Wi-Fi Component Operating System

17.4

Wi-Fi Component Firmware

17.4

RF Architecture

Bands Supported	Transmit (Tx)	Receive (Rx)
2.4 GHz	4	4
5 GHz	4	4

Certifications

2.4 GHz Spectrum Capabilities

20 MHz Channel Width
40 MHz Channel Width

5 GHz Spectrum Capabilities

20 MHz Channel Width
40 MHz Channel Width
80 MHz Channel Width
160 MHz Channel Width

Protected Management Frames

Spectrum & Regulatory

802.11d
802.11h

WMM®

WMM®-Power Save

Legacy Power Save

WMM®-Power Save (continued)

Unschedule auto PS

WPA2™-Enterprise 2018-04

EAP methods

WPA2™-Personal 2020-02

WPA3™-Enterprise 2020-02

EAP methods

WPA3™-Personal 2020-02

WPA™-Enterprise

WPA™-Personal

Wi-Fi Agile Multiband™

Automatically populate BSS Transition candidate list
Fast Transition OTA on WPA2-Enterprise

29