



# Cisco Catalyst 9800-80 Wireless Controller

Built from the ground up for intent-based networking

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## Product Overview



**Figure 1.**  
Cisco Catalyst 9800-80 Wireless Controller

Built from the ground-up for the Intent-based networking and Cisco DNA, Cisco Catalyst 9800 Series Wireless Controllers are Cisco IOS<sup>®</sup> XE based and integrate the RF excellence of Cisco Aironet<sup>®</sup> access points creating the best-in-class wireless experience for your evolving and growing organization. The Cisco Catalyst 9800 Series Wireless Controllers are 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<sup>®</sup> Catalyst<sup>®</sup> 9800-80 is a modular wireless controller with optional 100 Gigabit Ethernet (GE) modular uplinks and seamless software updates for large enterprises and campuse.

The Cisco Catalyst 9800-80 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 patching, keep your clients and services **always on** in planned and unplanned events.
- **Secure** air, devices, and users with the Cisco Catalyst 9800-80. 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: secure boot, runtime defenses, image signing, integrity verification, and hardware authenticity.
- Built on a modular operating system, the 9800-80 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**.

## Features

**Table 1.** Key features

Metric	Value
Maximum number of access points	Up to 6000
Maximum number of clients	64,000
Maximum throughput	Up to 80 Gbps
Maximum WLANs	4096

Metric	Value
Maximum VLANs	4096
Max site tags	6000
Max Flex APs per site	100
Max policy tags	6000
Max RF tags	6000
Max RF profiles	12000
Max policy profiles	1000
Max flex profiles	6000
Fixed uplinks	8x 10 GE or 6x 10 GE + 2x 1 GE SFP+/SFP
Modular uplinks (optional)	<p>The supported uplink modules are:</p> <ul style="list-style-type: none"> <li>• C9800-18X1GE(=)</li> <li>• C9800-10X10GE(=)</li> <li>• C9800-1X40GE(=)</li> <li>• C9800-2X40GE(=)</li> <li>• C9800-1X100GE(=)</li> </ul> <p>The uplink modules are hot-swappable. Supports 10 GE, 40 GE, and 100 GE QSFP transceivers</p>
Redundant power supply	AC or DC power supply
Maximum power consumption with modules	600W
Deployment modes	Centralized, Cisco FlexConnect <sup>®</sup> , and Fabric Wireless (SD-Access)
Form factor	2RU
License	Smart License enabled
Operating system	Cisco IOS XE
Management	Cisco DNA Center 1.2.8, Cisco Prime <sup>®</sup> Infrastructure 3.5, integrated WebUI, and third party (open standards APIs)
Interoperability	AireOS-based controllers with 8.8 MR2, 8.5 MR4 and 8.5 MR3 special
Policy engine	Cisco Identity Services Engine (ISE) 2.2, 2.3, and 2.4
Cisco Connected Mobile Experiences (CMX)	CMX 10.5.1
Access points	Aironet 802.11ac Wave 1 and Wave 2 access points

## 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.

## Secure

Secure air, devices, and users with the Cisco Catalyst 9800-80 Wireless Controller. Wireless infrastructure becomes the strongest first line of defense with ETA and SD-Access. The controller comes with built-in security: secure boot, runtime defenses, image signing, integrity verification, and hardware authenticity.

## Open and programmable

The controller is 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.

## Details



## Physical dimensions

Table 2. Physical dimensions

Dimension	Value
Width	17.3 inches (43.94 cm)
Depth	20.5 inches (52.07 cm)
Height	3.47 inches (8.81 cm)
Weight	31.5 lb (14.29 kg)

## Front panel



Figure 2.  
Front panel

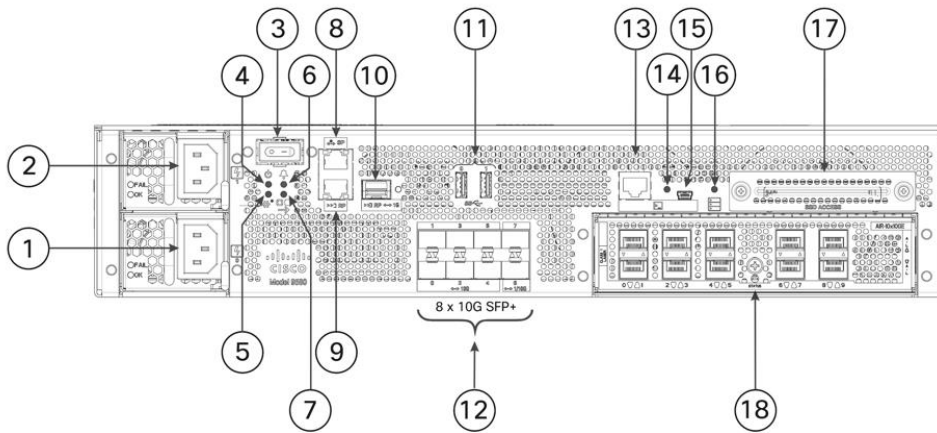


Figure 3.  
Front panel components

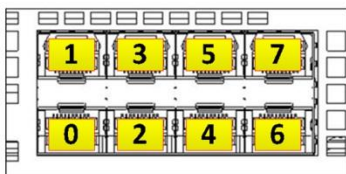


Figure 4.  
10 GE/1 GE ports

Table 3. Descriptions of front-panel components

Label	Component
1	Power supply (PEM 0)
2	Power supply (PEM 1)
3	Power (PWR) switch
4	PWR: Power LED
5	SYS: System LED

Label	Component
6	ALM: Alarm LED
7	HA: High-availability LED
8	SP: RJ-45 10/100/1000 management Ethernet port
9	RP: RJ-45 10/100/1000 redundancy Ethernet port
10	RP: 1 GE SFP port (the only SFPs supported on the RP port are GLC-SX-MMD and GLC-LH-SMD)
11	USB ports 0 and 1
12	Fixed: 6x 10 GE and 2x 1 GE or 8x 10 GE
13	CON: RJ-45 compatible console port
14	LINK: RJ-45 connector LED
15	CON: Mini USB console port
16	SSD: SSD activity LED
17	SSD access
18	Modular uplink

## Ports

**Table 4.** Ports and their purposes

Port	Purpose
1x RJ-45 console port	Console port for out-of-band management
1x USB 3.0 console port	Console port for out-of-band management
2x USB 3.0 ports	USB 3.0 ports for plugging in external memory
1x RJ-45 management port	Management port for out-of-band management. Also known as service port.
1x RJ-45 redundancy port	Redundancy port used for SSO
1x SFP Gigabit Ethernet redundancy port	<ul style="list-style-type: none"> <li>Redundancy port used for SSO; works with Cisco supported SFPs (GLC-LH-SMD and GLC-SX-MMD) for RP port</li> </ul>
Fixed uplink: 10 GE SFP+/1 GE SFP ports	The ports are fixed uplinks, which can be used as 8x10 GE SFP+ or 6x 10 GE plus 2x 1 GE

Port	Purpose
Modular uplink	<p>The supported uplink modules are:</p> <ul style="list-style-type: none"> <li>• C9800-18X1GE(=)</li> <li>• C9800-10X10GE(=)</li> <li>• C9800-1X40GE(=)</li> <li>• C9800-2X40GE(=)</li> <li>• C9800-1X100GE(=)</li> </ul> <p>The uplink modules are hot-swappable.</p> <p>Supports 10 GE, 40 GE, and 100 GE QSFP transceivers</p>

## Front panel LEDs

**Table 5.** Front panel LEDs

LED	Color	Function
Power PWR	Green	Green if all power rails are within spec
STATUS SYS	Green	On: IOS has boot complete Blinking: IOS boot in progress
	Amber	On: System crash Blinking: Secure boot failure Off: ROMMON boot
ALARM ALM	Green	On: ROMMON boot complete Blinking: System upgrade in progress
	Amber	On: ROMMON boot and SYSTEM bootup Blinking: Temperature error and secure boot failure
HIGH AVAILABILITY HA	Green	On: HA active Blinking: HA standby hot
	Amber	Slow blink: Booted with HA standby cold Fast blink: HA maintenance
USB CON ENABLED EN	Green	When LED is lit, USB console is enabled (RJ-45 console is disabled)
10/100/1000 RJ45 I/F LINK	Green	Solid green indicates link
10/100/1000 RJ45 I/F ACTIVITY	Green	Flashing green indicates activity
SSD Activity SSD	Green	Indicates active use of the hard disk SSD memory devices in the unit



## Rear panel



**Figure 5.**  
Rear panel

- The chassis has a front-to-rear airflow.
- Four internal fans draw cooling air in through the front of the chassis and across the internal components to maintain an acceptable operating temperature.
- The fans are located at the rear of the chassis.
- The fans are numbered from 0 to 3, right to left.

## Power

The 9800-80 controller ships with redundant power supply units, either AC or DC, based on the customer's choice.

The Power Entry Module (PEM) provides redundant power to the system, and the 9800-80 can operate continuously with only a single PEM installed. The PEMs are hot-swappable, and replacement of a single PEM can be made without power interruption to the system. All external connections to the PEMs are made from the rear panel of the chassis, and they are removed or inserted from the rear. The main power switch for the unit is located directly next to the PEMs on the rear of the chassis.

**Table 6.** Power supply options

Power supply condition	Green (OK) LED status	Amber (Fail) LED status
No AC power to all power supplies	Off	Off
Power supply failure (includes over voltage, over current, over temperature, and fan failure)	Off	Red for power supply failure Amber for fan failure
Power supply warning events in which the power supply continues to operate (high temperature, high power, and slow fan)	Off	1 Hz blinking

**Note:** Redundancy is supported with the same power supply types.

## SFPs supported

- All 1 GE, 10 GE, 40 GE, and 100 GE ports can be configured independently.
- Online Insertion and Removal (OIR) for SFP, SFP+, and QSFP.
- Modules are hot-swappable.

**Table 7.** SFPs supported

Type	Modules supported
Small Form-Factor Pluggable (SFP)	GLC-BX-D
	GLC-BX-U
	GLC-LH-SMD
	GLC-SX-MMD
	GLC-ZX-SMD
	GLC-TE
Enhanced SFP (SFP+)	SFP-10G-SR
	SFP-10G-SR-S
	SFP-10G-SR-X
	SFP-10G-LR
	SFP-10G-LRM
	SFP-10G-LR-X
	SFP-10G-ER
	SFP-10G-ZR
	SFP-H10GB-ACU7M
	SFP-H10GB-ACU10M
	DWDM-SFP10G-30.33 - DWDM-SFP10G-61.41
Quad SFP (QSFP)	QSFP-40G-SR4
	QSFP-40G-LR4
	QSFP-40GE-LR4
	QSFP-40G-ER4
	QSFP-40G-SR4-S
	QSFP-40G-LR4-S
	QSFP-40G-SR-BD
	QSFP-40G-BD-RX
	QSFP-100G-SR4-S
	QSFP-100G-LR4-S

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## Benefits

**Cisco IOS XE** 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 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 9800-80 Wireless Controller 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 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 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 9800-80 Wireless Controller 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.

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## 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.
- **Trustworthy systems:** Cisco Trust Anchor Technologies provide a highly secure foundation for Cisco products. With the Cisco Catalyst 9800-80, these trustworthy systems help assure hardware and 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.
  - **Secure boot:** Cisco Secure Boot technology anchors the boot sequence chain of trust to immutable hardware, mitigating threats against a system's foundational state and the software that is to be loaded, regardless of a user's privilege level. It provides layered protection against the persistence of illicitly modified firmware.
  - **Cisco trust anchor module:** A tamper-resistant, strong cryptographic, single-chip solution hardware uniquely identifies the product so that its origin can be confirmed to Cisco, providing assurance that the product is genuine.

## 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 9800-80. Some of the most popular applications included are Skype, Office 365, Microsoft Lync, Cisco Webex<sup>®</sup>, 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<sup>®</sup>, 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 9800-80 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 9800-80 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

- **Bluetooth ready:** The Cisco Catalyst 9800-80 has hardware support to connect a Bluetooth dongle to the controller, enabling you to use this wireless interface as a management port. This port functions as an IP management interface and can be used for configuration and troubleshooting using WebUI or the Command-Line Interface (CLI), and to transfer images and configurations.

- **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 8.** Specifications

Item	Specification	
<b>Wireless</b>	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	
<b>Wired, switching, and routing</b>	IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX, 1000BASE-T, 1000BASE-SX, 1000BASE-LH, IEEE 802.1Q VLAN tagging, IEEE 802.1AX Link Aggregation	
<b>Data standards</b>	<ul style="list-style-type: none"> <li>• RFC 768 User Datagram Protocol (UDP)</li> <li>• RFC 791 IP</li> <li>• RFC 2460 IPv6</li> <li>• RFC 792 Internet Control Message Protocol (ICMP)</li> <li>• RFC 793 TCP</li> <li>• RFC 826 Address Resolution Protocol (ARP)</li> <li>• RFC 1122 Requirements for Internet Hosts</li> <li>• RFC 1519 Classless Interdomain Routing (CIDR)</li> <li>• RFC 1542 Bootstrap Protocol (BOOTP)</li> <li>• RFC 2131 Dynamic Host Configuration Protocol (DHCP)</li> <li>• RFC 5415 Control and Provisioning of Wireless Access Points (CAPWAP) Protocol</li> <li>• RFC 5416 CAPWAP Binding for 802.11</li> </ul>	
<b>Security standards</b>	<ul style="list-style-type: none"> <li>• Wi-Fi Protected Access (WPA)</li> <li>• IEEE 802.11i (WPA2, RSN)</li> <li>• RFC 1321 MD5 Message-Digest Algorithm</li> <li>• RFC 1851 Encapsulating Security Payload (ESP) Triple DES (3DES) Transform</li> <li>• RFC 2104 HMAC: Keyed-Hashing for Message Authentication</li> <li>• RFC 2246 TLS Protocol Version 1.0</li> <li>• RFC 2401 Security Architecture for the Internet Protocol</li> <li>• RFC 2403 HMAC-MD5-96 within ESP and AH</li> <li>• RFC 2404 HMAC-SHA-1-96 within ESP and AH</li> <li>• RFC 2405 ESP DES-CBC Cipher Algorithm with Explicit IV</li> <li>• RFC 2407 Interpretation for Internet Security Association Key Management Protocol (ISAKMP)</li> <li>• RFC 2408 ISAKMP</li> <li>• RFC 2409 Internet Key Exchange (IKE)</li> <li>• RFC 2451 ESP CBC-Mode Cipher Algorithms</li> <li>• RFC 3280 Internet X.509 Public Key Infrastructure (PKI) Certificate and Certificate Revocation List (CRL) Profile</li> <li>• RFC 4347 Datagram Transport Layer Security (DTLS)</li> <li>• RFC 5246 TLS Protocol Version 1.2</li> </ul>	
<b>Encryption standards</b>	<ul style="list-style-type: none"> <li>• Static Wired Equivalent Privacy (WEP) RC4 40, 104 and 128 bits</li> <li>• Advanced Encryption Standard (AES): Cipher Block Chaining (CBC), Counter with CBC-MAC (CCM), Counter with CBC Message Authentication Code Protocol (CCMP)</li> </ul>	

Item	Specification	
	<ul style="list-style-type: none"> <li>• Data Encryption Standard (DES): DES-CBC, 3DES</li> <li>• Secure Sockets Layer (SSL) and Transport Layer Security (TLS): RC4 128-bit and RSA 1024-bit and 2048-bit</li> <li>• DTLS: AES-CBC</li> <li>• IPsec: DES-CBC, 3DES, AES-CBC</li> <li>• 802.1AE MACsec encryption</li> </ul>	
<b>Authentication, Authorization, and Accounting (AAA)</b>	<ul style="list-style-type: none"> <li>• IEEE 802.1X</li> <li>• RFC 2548 Microsoft Vendor-Specific RADIUS Attributes</li> <li>• RFC 2716 Point-to-Point Protocol (PPP) Extensible Authentication Protocol (EAP)-TLS</li> <li>• RFC 2865 RADIUS Authentication</li> <li>• RFC 2866 RADIUS Accounting</li> <li>• RFC 2867 RADIUS Tunnel Accounting</li> <li>• RFC 2869 RADIUS Extensions</li> <li>• RFC 3576 Dynamic Authorization Extensions to RADIUS</li> <li>• RFC 5176 Dynamic Authorization Extensions to RADIUS</li> <li>• RFC 3579 RADIUS Support for EAP</li> <li>• RFC 3580 IEEE 802.1X RADIUS Guidelines</li> <li>• RFC 3748 Extensible Authentication Protocol (EAP)</li> <li>• Web-based authentication</li> <li>• TACACS support for management users</li> </ul>	
<b>Management standards</b>	<ul style="list-style-type: none"> <li>• Simple Network Management Protocol (SNMP) v1, v2c, v3</li> <li>• RFC 854 Telnet</li> <li>• RFC 1155 Management Information for TCP/IP-based Internets</li> <li>• RFC 1156 MIB</li> <li>• RFC 1157 SNMP</li> <li>• RFC 1213 SNMP MIB II</li> <li>• RFC 1350 Trivial File Transfer Protocol (TFTP)</li> <li>• RFC 1643 Ethernet MIB</li> <li>• RFC 2030 Simple Network Time Protocol (SNTP)</li> <li>• RFC 2616 HTTP</li> <li>• RFC 2665 Ethernet-Like Interface Types MIB</li> <li>• RFC 2674 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering, and Virtual Extensions</li> <li>• RFC 2819 Remote Monitoring (RMON) MIB</li> <li>• RFC 2863 Interfaces Group MIB</li> <li>• RFC 3164 Syslog</li> <li>• RFC 3414 User-Based Security Model (USM) for SNMPv3</li> <li>• RFC 3418 MIB for SNMP</li> <li>• RFC 3636 Definitions of Managed Objects for IEEE 802.3 MAUs</li> <li>• RFC 4741 Base NETCONF protocol</li> <li>• RFC 4742 NETCONF over SSH</li> <li>• RFC 6241 NETCONF</li> <li>• RFC 6242 NETCONF over SSH</li> <li>• RFC 5277 NETCONF event notifications</li> <li>• RFC 5717 Partial Lock Remote Procedure Call</li> <li>• RFC 6243 With-Defaults capability for NETCONF</li> <li>• RFC 6020 YANG</li> <li>• Cisco private MIBs</li> </ul>	

Item	Specification	
Management interfaces	<ul style="list-style-type: none"> <li>• Web-based: HTTP/HTTPS</li> <li>• Command-line interface: Telnet, Secure Shell (SSH) Protocol, serial port</li> <li>• SNMP</li> <li>• NETCONF</li> </ul>	
Hard Disk Drives (HDD)	<ul style="list-style-type: none"> <li>• SATA solid-state drive (SSD)</li> <li>• 240 GB of memory</li> </ul>	
Environmental conditions supported	<p>Operating temperature:</p> <ul style="list-style-type: none"> <li>• Normal: 0° to 45° C (32° to 113°F)</li> <li>• Short term: 5° to 50° C (41° to 122°F)</li> </ul> <p>Nonoperating temperature:</p> <ul style="list-style-type: none"> <li>• -40° to 65° C (-104° to 149°F)</li> </ul> <p>Operating humidity:</p> <ul style="list-style-type: none"> <li>• Normal: 5% to 85% noncondensing</li> <li>• Short term: 5% to 90% noncondensing</li> </ul> <p>Nonoperating temperature humidity:</p> <ul style="list-style-type: none"> <li>• 5% to 93% at 82°F (28°C)</li> </ul> <p>Operating altitude:</p> <ul style="list-style-type: none"> <li>• Appliance operating: 0 to 3000 m (0 to 10,000 ft)</li> <li>• Appliance nonoperating: 0 to 12,192 m (0 to 40,000 ft)</li> </ul> <p>Electrical input:</p> <ul style="list-style-type: none"> <li>• AC input frequency range: 47 to 63 Hz</li> <li>• AC input range: 90 to 264 VAC with AC PEM</li> <li>• DC input range: -40 to -72 VDC with DC PEM</li> </ul> <p>Maximum power with modules: 600W</p> <p>Heat dissipation: 2047 BTU/hr</p> <p>Sound power level measure:</p> <ul style="list-style-type: none"> <li>• A-weighted sound power level is 70.5 LpAm(dBA) @ 27C nominal operation</li> </ul>	
Regulatory compliance	<p>Safety:</p> <ul style="list-style-type: none"> <li>• UL/CSA 60950-1</li> <li>• IEC/EN 60950-1</li> <li>• AS/NZS 60950.1</li> <li>• CAN/CSA-C22.2 No. 60950-1</li> </ul>	
	<p>EMC – Emissions:</p> <ul style="list-style-type: none"> <li>• FCC 47CFR15</li> <li>• AS/NZS CISPR 22</li> <li>• CISPR 22</li> <li>• EN55022/EN55032 (EMI-1)</li> <li>• ICES-003</li> <li>• VCCI</li> <li>• KN 32 (EMI-2)</li> <li>• CNS-13438</li> </ul>	Class A
	<p>EMC – Emissions:</p> <ul style="list-style-type: none"> <li>• EN61000-3-2 Power Line Harmonics (EMI-3)</li> <li>• EN61000-3-3 Voltage Changes, Fluctuations, and Flicker (EMI-3)</li> </ul>	
	<p>EMC – Immunity:</p>	

Item	Specification	
	<ul style="list-style-type: none"> <li>IEC/EN61000-4-2 Electrostatic Discharge Immunity</li> <li>IEC/EN61000-4-3 Radiated Immunity</li> <li>IEC/EN61000-4-4 EFT-B Immunity (AC Power Leads)</li> <li>IEC/EN61000-4-4 EFT-B Immunity (DC Power Leads)</li> <li>IEC/EN61000-4-4 EFT-B Immunity (Signal Leads)</li> <li>IEC/EN61000-4-5 Surge AC Port</li> <li>IEC/EN61000-4-5 Surge DC Port</li> <li>IEC/EN61000-4-5 Surge Signal Port</li> <li>IEC/EN61000-4-6 Immunity to Conducted Disturbances</li> <li>IEC/EN61000-4-8 Power Frequency Magnetic Field Immunity</li> <li>IEC/EN61000-4-11 Voltage Dips, Short Interruptions, and Voltage Variations</li> <li>K35 (EMI-2)</li> </ul>	
	EMC (ETSI/EN) <ul style="list-style-type: none"> <li>EN 300 386 Telecommunications Network Equipment (EMC) (EMC-3)</li> <li>EN55022 Information Technology Equipment (Emissions)</li> <li>EN55024/CISPR 24 Information Technology Equipment (Immunity)</li> <li>EN50082-1/EN61000-6-1 Generic Immunity Standard (EMC-4)</li> </ul>	

## Software Requirements

The Cisco Catalyst 9800-80 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 9.** Minimum software requirements

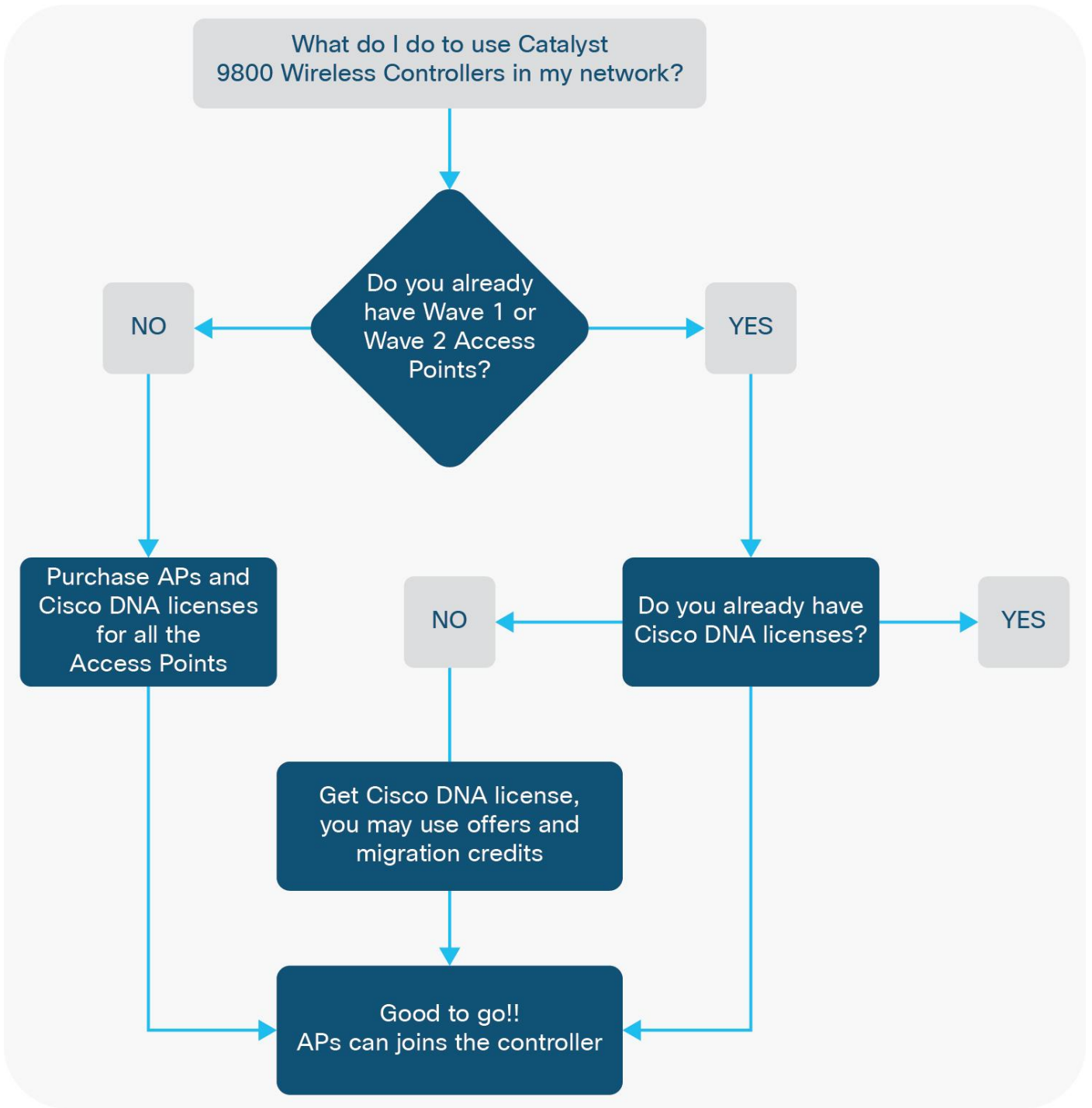
Model	Description	Minimum software requirement
C9800-80-K9	Cisco Catalyst 9800-80 Wireless Controller	Cisco IOS XE Software Release 16.10.1

## Licensing

**The Cisco Catalyst 9800 Series Wireless Controllers require mandatory Smart Licensing.** This provides ease of use for Cisco DNA license management, consumption, and tracking.

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 licenses are required. Every access point connecting to Catalyst 9800 requires a Cisco DNA subscription license to be entitled to connect to the controller. See Figure 2.





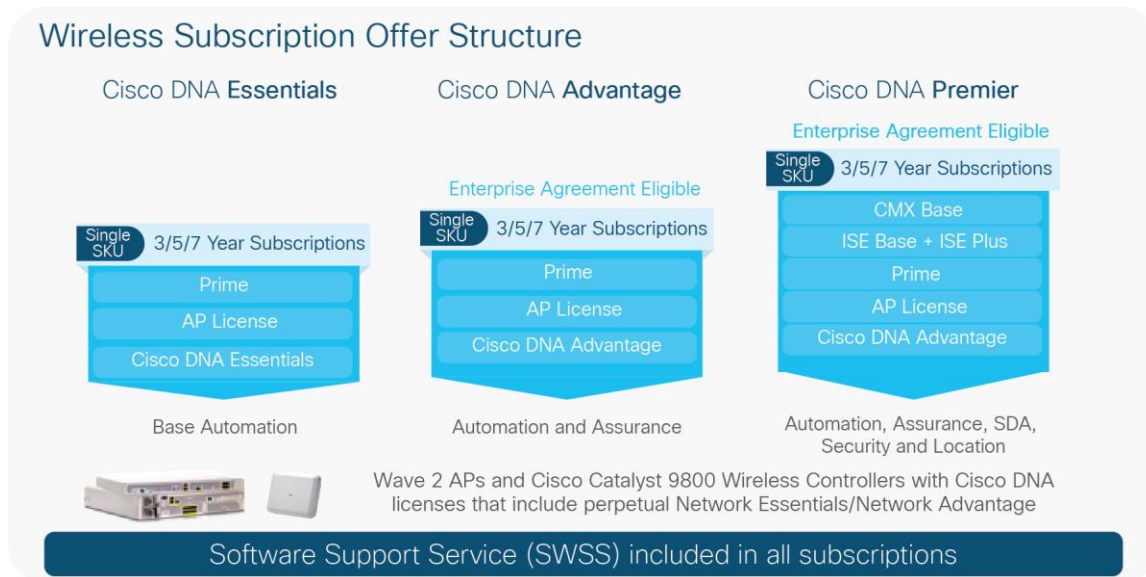
**Figure 6.**  
The APs connecting to Catalyst 9800 has a new and simplified licensing package

They can support 3 types of Cisco DNA license: Cisco DNA Essentials, Cisco DNA Advantage and Cisco DNA Premier:

The Cisco DNA licenses provide Cisco innovations on the AP. The Cisco DNA license also includes the Network Essentials and Network Advantage licensing options which cover wireless fundamentals such as 802.1x authentication, QoS, PnP etc, telemetry and visibility, SSO, as well as security controls. These Network essentials and Network advantage components are perpetual and is valid till the life of the AP.

Cisco DNA subscription licenses have to be purchased for a 3-, 5-, or 7-year subscription term. However, upon expiry of Cisco DNA license, Cisco DNA features will expire, whereas network essentials and network advantage features will remain.

Here is a brief description of what each base and add-on package includes:



## Catalyst 9800 Wireless Controller- Advantage vs. Essentials

C9800-40/C9800-80/C9800-CL

Advantage		Essentials	
<b>Cisco DNA Advantage (Inclusive of Cisco DNA Essentials)</b>		<b>Cisco DNA Essentials</b>	
3,5,7 Year Terms		3,5,7 Year Terms	
<p><b>Advanced Automation</b></p> <ul style="list-style-type: none"> <li>SD-Access</li> <li>Location Plug and Play</li> <li>Automated ISE integration for guest</li> <li>Third Party API integration</li> </ul> <p><b>Enhanced Security &amp; IoT</b></p> <ul style="list-style-type: none"> <li>Encrypted Traffic Analytics</li> <li>Advanced WIPS*</li> </ul> <p><b>Policy Based Workflows</b></p> <ul style="list-style-type: none"> <li>EasyQos configuration</li> <li>EasyQos monitoring</li> <li>Policy-based Automation</li> </ul>	<p><b>Assurance and Analytics</b></p> <ul style="list-style-type: none"> <li>Guided Remediation</li> <li>Apple iOS Insights</li> <li>Proactive issue Detection                             <ul style="list-style-type: none"> <li>Aironet Active Sensor Tests</li> <li>Intelligent capture</li> <li>Client Location Heatmaps</li> <li>Spectrum Analyzer</li> </ul> </li> <li>Application performance (Packet Loss, Latency and Jitter)</li> <li>App 360, AP 360, Client 360 and WLC 360</li> <li>Custom Reports*</li> </ul> <p><b>Element Management</b></p> <ul style="list-style-type: none"> <li>Path Lifecycle Management</li> </ul>	<p><b>Basic Automation</b></p> <ul style="list-style-type: none"> <li>PhP Application</li> <li>Network Site Design and Device Provisioning</li> </ul> <p><b>Element Management</b></p> <ul style="list-style-type: none"> <li>Software Image Management</li> <li>Discovery, Network Topology</li> <li>AVC</li> </ul> <p><b>Telemetry</b></p> <ul style="list-style-type: none"> <li>Flexible Netflow</li> </ul> <p><b>Basic Assurance</b></p> <ul style="list-style-type: none"> <li>Health dashboard (Network, Client and Application)</li> <li>AP Floorplan and Coverage map</li> <li>Pre-defined Reports</li> </ul> <p><b>Base Security</b></p> <ul style="list-style-type: none"> <li>Basic WIPS*</li> </ul>	
<b>Network Advantage (Inclusive of Network Essentials)</b>		<b>Network Essentials</b>	
Perpetual		Perpetual	
<p><b>High Availability and Resiliency</b></p> <ul style="list-style-type: none"> <li>ISSU, Process Restart</li> <li>Rolling AP Upgrades</li> <li>Patching (CLI)</li> <li>AP service pack/AP device pack</li> </ul> <p><b>Flexible Network Segmentation</b></p> <ul style="list-style-type: none"> <li>VXLAN</li> </ul>	<p><b>Essential Wireless Capabilities</b></p> <ul style="list-style-type: none"> <li>802.1x authentications, Guest access, device onboarding, Infra and client IPv6, ACLs, QoS, Videostream, Smart defaults, RRM, Spectrum intelligence, BLE, Zigbee, USB, TrustSec SXP, SSO, Dynamic QoS, Analytics, ADP, OpenDNS, IPSec, Rogue Management and Detection, Mobility</li> </ul> <p><b>Optimized RF</b></p> <ul style="list-style-type: none"> <li>FRA, Client link, Clear Air Advanced</li> <li>NG-HDX, Predictive/Proactive RRM</li> </ul> <p><b>IoT Optimized</b></p> <ul style="list-style-type: none"> <li>Identity PSK, Enhanced Device profilers</li> </ul>	<p><b>DevOps Integration</b></p> <ul style="list-style-type: none"> <li>PhP Agent</li> <li>NETCONF, RESTCONF*, gNMI*</li> <li>Yang Data Models</li> <li>GuestShell (On-Box Python)*</li> </ul> <p><b>Telemetry and Visibility</b></p> <ul style="list-style-type: none"> <li>Model-driven Telemetry</li> <li>NETCONF dial-in, gRPC dial out*</li> </ul> <p><b>Federal Certifications*</b></p> <ul style="list-style-type: none"> <li>FIPS, CC, UCAPL, USGV6</li> </ul>	
<ul style="list-style-type: none"> <li>Cat 9800 controller <b>includes</b> the <b>Perpetual Network Stack - Network Essentials or Network Advantage</b></li> <li><b>Mandatory to attach Cisco DNA License for every AP joining the controller</b></li> <li>Cisco DNA License <b>includes Wireless and Cisco DNA Center Features</b></li> </ul>			
*Future			

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

The following table shows the features included in the Network Advantage and Network Essentials package.

**Table 10.** Features included in the Network Advantage and Network Essentials packages

Features	Network Essentials	Network Advantage
<b>Essential capabilities</b> <ul style="list-style-type: none"> <li>802.1x authentications, Guest access, device onboarding, Infra and client IPv6, ACLs, QoS, Videostream, Smart defaults, RRM, Spectrum intelligence, BLE, Zigbee, USB, TrustSec SXP,SSO, Dynamic QoS, Analytics, ADP, OpenDNS, mDNS, IPSec, Rogue Management and Detection, Mobility</li> </ul>	✓	✓
<b>Optimized RF</b> <ul style="list-style-type: none"> <li>FRA, Client link, ClearAir Advanced</li> <li>NG-HDX, Predictive/Proactive RRM</li> </ul>	✓	✓
<b>Internet of Things (IoT) optimized</b> <ul style="list-style-type: none"> <li>Identity pre-shared keys (PSK), enhanced device profilers</li> </ul>	✓	✓
<b>DevOPS integration</b> <ul style="list-style-type: none"> <li>PnP Agent</li> <li>NETCONF, RESTCONF<sup>†</sup>, gNMI<sup>†</sup></li> <li>Yang Data Models</li> <li>GuestShell (On-Box Python)<sup>*</sup></li> </ul>	✓	✓
<b>Federal certifications</b> <ul style="list-style-type: none"> <li>Federal Information Processing Standards (FIPS), CC, UCAPL, USGV6</li> </ul>	✓	✓
<b>Telemetry and visibility</b> <ul style="list-style-type: none"> <li>Model-driven Telemetry</li> <li>NETCONF dial-in, gRPC dial out<sup>*</sup></li> </ul>	✓	✓
<b>High availability and resiliency (advanced)</b> <ul style="list-style-type: none"> <li>ISSU, Process Restart</li> <li>Rolling AP Upgrades</li> <li>Patching (CLI)</li> <li>AP service pack/AP device pack</li> </ul>	X	✓
<b>Flexible network segmentation</b> <ul style="list-style-type: none"> <li>VXLAN</li> </ul>	X	✓

The following table shows the features included in the Cisco DNA Advantage and Cisco DNA Essentials packages.

**Table 11.** Features included in the Cisco DNA Advantage and Cisco DNA Essentials packages

Features	Cisco DNA Essentials	Cisco DNA Advantage/Premier
<b>Base automation</b> Plug and Play, network site design and device provisioning	✓	✓
<b>Element management</b> Image management, network topology and discovery, AVC	✓	✓
<b>Base assurance</b> Health dashboard (network, client, and application), AP floor map and coverage map, predefined reports	✓	✓
<b>Telemetry</b> Flexible NetFlow	✓	✓
<b>Base security</b> Basic wireless IPS	✓	✓
<b>Advanced automation</b> SD-Access Location plug and play Automated ISE integration for guest 3rd party API integration	X	✓
<b>Assurance and Analytics</b> Guided remediation Apple iOS insights Proactive issue detection <ul style="list-style-type: none"> <li>• Aironet active sensor tests</li> <li>• Intelligent capture</li> <li>• Client location heatmaps</li> <li>• Spectrum analyzer</li> </ul> Application performance (Packet Loss, Latency and Jitter), App 360, AP 360, Client 360 and WLC 360 Custom Reports*	X	✓
<b>Enhanced security and IoT</b> Encrypted traffic analytics, Advanced WIPS	X	✓

Features	Cisco DNA Essentials	Cisco DNA Advantage/Premier
<b>Policy-based workflow</b> EasyQoS configuration, EasyQoS monitoring, Policy based automation	X	✓
<b>Element management</b> Patch lifecycle management	X	✓

Two modes of licensing are available:

- SL: Smart Licensing simplifies and adds flexibility to licensing. It is:
  - Simple: Procure, deploy, and manage licenses easily. Devices self-register, removing the need for Product Activation Keys (PAKs).
  - Flexible: Pool license entitlements in a single account. Move licenses freely through the network, wherever you need them.
  - Smart: Manage your license deployments with real-time visibility of ownership and consumption.
- SLR mode
  - 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 will be no communication with Cisco or a satellite. The licenses will be reserved for every controller. It will be node-based licensing.

Four 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 Essential: At this level the Cisco DNA Essentials features 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.
  - 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, 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](mailto:ask-catalyst9800licensing)

### Managing licenses with Smart Accounts

Creating Smart Accounts by using the Cisco Smart Software Manager (CSSM) 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 Catalyst 9800 controller. For more information on Smart Account refer to <https://www.cisco.com/go/smartaccounts>.

## Warranty

Find warranty information on Cisco.com at the [Product Warranties](#) page.

## Cisco 1-year limited hardware warranty terms

The following are terms applicable to your hardware warranty. 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.

**Duration of hardware warranty:** One (1) year.

**Replacement, repair, or refund procedure for hardware:** Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of the Return Materials Authorization (RMA) request. Actual delivery times may vary depending on customer location.

Cisco reserves the right to refund the purchase price as its exclusive warranty remedy.

## Ordering Information

**Table 12.** Ordering Information

Type	Product ID	Description
Wireless controller	C9800-80-K9	Cisco Catalyst 9800-80 Wireless Controller
	LIC-C9800-DTLS-K9	Cisco Catalyst 9800 Series Wireless Controller DTLS License
Accessories, spares	C9800-AC-1100W=	Cisco Catalyst Wireless Controller 1100 AC Power Supply
	C9800-DC-950W=	Cisco Catalyst Wireless Controller 950W DC Power Supply
	C9800-18X1GE(=)	Cisco Catalyst 9800-80 GE Module
	C9800-10X10E(=)	Cisco Catalyst 9800-80 10 GE Module
	C9800-1X40GE(=)	Cisco Catalyst 9800-80 1 Port 40 GE Module
	C9800-2X40GE(=)	Cisco Catalyst 9800-80 2 Ports 40 GE Module
	C9800-1X100GE(=)	Cisco Catalyst 9800-80 1 Port 100 GE Module

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## Document History

New or revised topic	Described In	Date
Licensing Information updated	<a href="#">Licensing</a>	December 6, 2018
Cosmetic changes to various tables were made	<a href="#">Tables</a>	November 15, 2018
Updated images wer included	<a href="#">Images</a>	November 15, 2018

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