Release Notes for Cisco Catalyst 9800 Series Wireless Controller, Cisco IOS XE Cupertino 17.8.x

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Introduction to Cisco Catalyst 9800 Series Wireless Controllers

The Cisco Catalyst 9800 Series Wireless Controllers comprise next-generation wireless controllers (referred to as *controller* in this document) built for intent-based networking. The Catalyst 9800 Series Wireless Controllers are Cisco IOS XE based and integrate the radio frequency (RF) capabilities from Cisco Aironet with the intent-based networking capabilities of Cisco IOS XE to create a best-in-class wireless experience for your organization.

The Catalyst 9800 controllers are enterprise ready to power your business-critical operations and transform end-customer experiences:

- The controllers come with high availability and seamless software updates that are enabled by hot and cold patching. This keeps your clients and services up and running always, both during planned and unplanned events.
- The controllers come with built-in security, including secure boot, run-time defenses, image signing, integrity verification, and hardware authenticity.
- The controllers can be deployed anywhere to enable wireless connectivity, for example, on an on-premise device, on cloud (public or private), or embedded on a Cisco Catalyst switch (for SDA deployments) or a Cisco Catalyst access point (AP).
- The controllers can be managed using Cisco Cisco Catalyst Center, programmability interfaces, for example, NETCONF and YANG, or web-based GUI or CLI.
- The controllers are built on a modular operating system. Open and programmable APIs enable the automation of your day zero to day *n* network operations. Model-driven streaming telemetry provides deep insights into your network and client health.

The Catalyst 9800 Series controllers are available in multiple form factors to cater to your deployment options:

- Catalyst 9800 Series Wireless Controller Appliance
- Catalyst 9800 Series Wireless Controller for Cloud
- Catalyst 9800 Embedded Wireless Controller for a Cisco switch

Note All the Cisco IOS-XE programmability-related topics on the Cisco Catalyst 9800 controllers are supported by DevNet, either through community-based support or through DevNet developer support. For more information, go to https://developer.cisco.com.

What's New in Cisco IOS XE Cupertino 17.8.1

Table 1: New and Modified Software Features

Feature Name	Description and Documentation Link
AP Power Save	This feature allows a network administrator to force the APs to operate in low-power mode to reduce power consumption. The following commands are introduced: • **ethernet interface speed lan state** • **radio state shutdown** • **usb 0 state disable** • **action power-saving-mode power-profile** • **wireless profile power** For more information, see the chapter AP Power Save.
Base WGB on Indoor 11ax APs	From this release, Workgroup bridge (WGB) is supported on the following Cisco Catalyst 9100 Series Access Points: • Cisco Catalyst 9105 • Cisco Catalyst 9115 • Cisco Catalyst 9120
BLE Management on Cisco Catalyst 9136 Series Access Points	From this release, Bluetooth Low Energy (BLE) management is supported in Cisco Catalyst 9136 Series Access Points. For more information, see the chapter IoT Services Management.
CLI Boot System	The **boot system flash** *word* command is replaced with the **boot system flash bootflash:** command. The **bootflash:** keyword allows you to specify a local file system. For more information, see the **boot system flash** command in the Cisco Catalyst 9800 Series Wireless Controller Command Reference document.

Feature Name	Description and Documentation Link
Client Limit and Delete Reason	From this release, client limiting is supported per AP, per radio, and per AP radio per WLAN. Client limiting is supported on the Cisco Catalyst 9136 Series Access Points in FlexConnect mode. The following commands are introduced: • **association-limit** • **high-density clients count** For more information, see the chapter Client Limit.
Configuring XOR Radio Role Sniffer Support in APs	From this release, the XOR radio in APs such as Cisco 2800, 3800, 4800, and the 9100 series, support sniffer role in a single radio interface. For more information, see the chapter Sniffer Mode.
Disabling Device Tracking to Support NAC Devices	This feature provides the capabilities to control the flow of traffic between wireless clients using a network access control (NAC) device. The following command is introduced: • **show platform software arp broadcast** For more information, see the chapter Disabling Device Tracking to Support NAC Devices.
Environmental Sensors Support on Cisco Catalyst 9136 AP	This feature helps you to collect real-time environmental data, such as, air quality, temperature, and humidity, from the environmental sensors that are embedded in the Cisco Catalyst 9136 Series Access Points. The following commands are introduced: • **sensor environment** {**air-quality** | **temperature**} • **sampling** • **ap name** *ap-name* **[no] sensor environment** {**air-quality** | **temperature**} **shutdown** • **show ap sensor status** For more information, see the chapter Environmental Sensors in Access Points.

Feature Name	Description and Documentation Link
Exporting Device Analytics to Cisco DNA Center	From this release, the Controller supports the sending of the following device analytics information to Cisco DNA Center, at an interval of 5 minutes: • AP neighbor report of Intel clients (maximum of 10). • Latest low RSSI, temporary disconnection, failed AP, and unknown AP reports. • Low RSSI BSSID and AP neighbor report of current BSSID.
FlexConnect High Scale Mode	From this release, the flex site site capacity has been scaled up to accommodate 300 APs and 3000 802.1x clients. The following commands are introduced: • **show wireless stats pmk-propagation** • **pmk propagate** For more information, see the chapter FlexConnect Site Scaling.
IPv6 Support: OEAP URL-based ACLs for Split Tunnel	IPv6 addressing is supported on the Cisco OEAP Split Tunneling feature. For more information, see the chapter Cisco OEAP Split Tunneling.
Nearest Wired Service Provider Discovery on mDNS	This feature supports the following functionalities: • Nearest mDNS-based wired service filtering. (Supported in centrally-switched local mode.) • Custom wired service policy support for FlexConnect mode. • VLAN and MAC-based wired service filtering. (Supported in centrally-switched local mode.) For more information, see the chapter Multicast Domain Name System.
New SFP Support	FINISAR Small Form-factor Pluggable (SFP) modules are supported on the built-in (fixed) data ports of the Cisco Catalyst 9800-80 Wireless Controller, the Cisco Catalyst 9800-40 Wireless Controller, and the Cisco Catalyst 9800-L Wireless Controller. The Cisco Catalyst 9800-40 Wireless Controller and Cisco Catalyst 9800-L Wireless Controller do not support in the Ethernet port adapter (EPA) slot. See Table 5: Supported PIDs and Ports, on page 10for the list of supported SFPs.

Feature Name	Description and Documentation Link
Public IP Support for Cisco Catalyst 9800-CL Cloud Wireless Controller Hosted on the Public Cloud (GCP, AWS and Azure)	The Controllers in GCP, AWS environment and Microsoft Azure Cloud Service uses a public IP address to host in public cloud. For more information, see the Cisco Catalyst 9800-CL Cloud Wireless Controller Installation Guide.
RLAN Authentication Fallback	Remote LAN (RLAN) ports on OfficeExtend Access Points (OEAPs) support the fallback mechanism for authentication from 802.1X to MAC authentication bypass (MAB) and vice versa. The following commands are introduced: • **security dot1x request** • **security dot1x identity-request** For more information, see the chapter Remote LANs.
RLAN support for Cisco Catalyst IW6300 Heavy Duty Series and 6300 Series Embedded Services Access Points	RLAN is used for authenticating wired clients using the controller. Once the wired client successfully joins the controller, the LAN ports switch the traffic between central or local switching modes. The traffic from the wired clients is treated as wireless client traffic. The RLAN in Access Point (AP) sends the authentication request to authenticate the wired client. The authentication of the wired clients in RLAN is similar to the central authenticated wireless client. For more information, see the chapter Remote LANs.
Simplifying WGB Configuration	This feature helps to import a running workgroup bridge (WGB) configuration and deploy it in multiple WGBs in a network. The following commands are introduced: • **copy configuration upload** • **copy configuration download** For more information, see the chapter Workgroup Bridges.
Support for Dedicated Scan Radio in Cisco Catalyst 9136 Access Points	This feature supports a non-client-serving auxiliary radio dedicated to the off-channel functionality.
Support for Inline Tagging over Port-Channel	From this release, inline tagging over port-channels is supported. **Note** If you downgrade to a Cisco IOS XE release that does not support inline tagging over port-channels, the port-channels may be suspended. For more information, see the chapter Cisco TrustSec.

Feature Name	Description and Documentation Link
Support reliable WGB downstream multicast and broadcast on multiple VLANs for Cisco Catalyst IW6300 Heavy Duty Series and 6300 Series Embedded Services Access Points	This feature provides an enhancement for downstream multicast and broadcast targeted for WGB with different VLAN wired clients. Multicast or broadcast packets can be converted to unicast packet with retransmission, which reduces the loss of broadcast and multicast packets. For more information, see the chapter Workgroup Bridges.
Support Universal WGB mode on Cisco Wide Pluggable Form Factor WIFI6 AP Module for Industrial Routers (WP-WIFI6-x)	Universal WGB (uWGB) is a complementary mode of WGB feature that acts as a wireless bridge between the wired client connected to uWGB and wireless infrastructure including Cisco and non-Cisco wireless network. For more information, see the chapter Configuring uWGB.
TrustSec support for Cisco Catalyst IW6300 Heavy Duty Series and 6300 Series Embedded Services Access Points	This feature supports to enable and configure Cisco TrustSec Security Group ACL (SGACL) in Flexconnect and Flex+Bridge mode. SGACL enforcement will be carried out on the controller for local and Bridge mode. Inline Tagging configuration and SXP connections are supported only in Flexconnect mode. For more information, see the chapter Cisco TrustSec.

Note CAPWAP External Header DSCP ceiling based on QoS metal profile is now supported starting 17.8.1.

Table 2: New and Modified GUI Features

Feature Name	GUI Path
Configuring XOR Radio Role Sniffer Support in APs	• **Configuration > Wireless > Access Points**
AP Power Save	• **Configuration > Tags & Profiles > Power Profile** • **Configuration > Tags & Profiles > Calendar** • **Configuration > Tags & Profiles > AP Join**
Client Limit and Delete Reason	• **Configuration > Tags & Profiles > AP Join**
FlexConnect High Scale Mode	• **Configuration > Tags & Profiles > Flex**
Nearest Wired Service Provider Discovery on mDNS	• **Configuration > Services > mDNS**

MIBs

The following MIBs are newly added or modified:

- AIRESPACE-WIRELESS-MIB
- CISCO-LWAPP-AP-MIB
- CISCO-LWAPP-DOT11-MIB
- CISCO-LWAPP-MESH-MIB
- CISCO-LWAPP-MOBILITY-MIB
- CISCO-LWAPP-QOS-MIB
- CISCO-LWAPP-SI-MIB
- CISCO-LWAPP-WLAN-POLICY-MIB

Behavior Changes

- The USB port in the AP profile is disabled by default.

  If you are using Cisco IOx application with USB dongles, re-configure the USB port in the AP profile on reload, to ensure that the USB port is enabled before the APs join.

  For more information about the workaround, see the details in CSCvz07021.

Interactive Help

The Cisco Catalyst 9800 Series Wireless Controller GUI features an interactive help that walks you through the GUI and guides you through complex configurations.

You can start the interactive help in the following ways:

- By hovering your cursor over the blue flap at the right-hand corner of a window in the GUI and clicking **Interactive Help**.
- By clicking **Walk-me Thru** in the left pane of a window in the GUI.
- By clicking **Show me How** displayed in the GUI. Clicking **Show me How** triggers a specific interactive help that is relevant to the context you are in.

  For instance, **Show me How** in **Configure** > **AAA** walks you through the various steps for configuring a RADIUS server. Choose **Configuration**> **Wireless Setup** > **Advanced** and click **Show me How** to trigger the interactive help that walks you through the steps relating to various kinds of authentication.

The following features have an associated interactive help:

- Configuring AAA
- Configuring FlexConnect Authentication
- Configuring 802.1x Authentication

- Configuring Local Web Authentication
- Configuring OpenRoaming
- Configuring Mesh APs

Note If the WalkMe launcher is unavailable on Safari, modify the settings as follows:

1. Choose **Preferences** > **Privacy**.
2. In the **Website tracking** section, uncheck the **Prevent cross-site tracking** check box to disable this action.
3. In the **Cookies and website data** section, uncheck the **Block all cookies** check box to disable this action.

Important Notes

- To migrate public IP address from 16.12.x to 17.x. ensure that you configure the **service internal** command. If you do not configure the **service internal** command, the IP address does not carry forward.
- The Cisco Aironet 2800 and 3800 APs do not reset an interface (to clear any Ethernet interface physical layer issues) if the Dynamic Host Configuration Protocol (DHCP) does not resolve the IP address within a certain duration.

Supported Hardware

The following table lists the supported virtual and hardware platforms. (See Table 5: Supported PIDs and Ports for the list of supported modules.)

Table 3: Supported Virtual and Hardware Platforms

Platform	Description
Cisco Catalyst 9800-80 Wireless Controller	A modular wireless controller with up to 100-GE modular uplinks and seamless software updates. The controller occupies a 2-rack unit space and supports multiple module uplinks.
Cisco Catalyst 9800-40 Wireless Controller	A fixed wireless controller with seamless software updates for mid-size to large enterprises. The controller occupies a 1-rack unit space and provides four 1-GE or 10-GE uplink ports.
Cisco Catalyst 9800-L Wireless Controller	The Cisco Catalyst 9800-L Wireless Controller is the first low-end controller that provides a significant boost in performance and features.

Platform	Description
Cisco Catalyst 9800 Wireless Controller for Cloud	A virtual form factor of the Catalyst 9800 Wireless Controller that can be deployed in a private cloud (supports VMware ESXi, Kernel-based Virtual Machine [KVM], Microsoft Hyper-V, and Cisco Enterprise NFV Infrastructure Software [NFVIS] on Enterprise Network Compute System [ENCS] hypervisors), or in the public cloud as Infrastructure as a Service (IaaS) in Amazon Web Services (AWS), Google Cloud Platform (GCP) marketplace, and Microsoft Azure.
Cisco Catalyst 9800 Embedded Wireless Controller for Switch	The Catalyst 9800 Wireless Controller software for the Cisco Catalyst 9000 switches brings the wired and wireless infrastructure together with consistent policy and management. This deployment model supports only Software Defined-Access (SDA), which is a highly secure solution for small campuses and distributed branches.

The following table lists the host environments supported for private and public cloud.

Table 4: Supported Host Environments for Public and Private Cloud

Host Environment	Software Version
VMware ESXi	• VMware ESXi vSphere 6.0, 6.5, 6.7, and 7.0 • VMware ESXi vCenter 6.0, 6.5, 6.7, and 7.0
KVM	• Linux KVM-based on Red Hat Enterprise Linux 7.6, 7.8, and 8.2 • Ubuntu 16.04.5 LTS, Ubuntu 18.04.5 LTS, Ubuntu 20.04.5 LTS
AWS	AWS EC2 platform
NFVIS	ENCS 3.8.1 and 3.9.1
GCP	GCP marketplace
Microsoft Hyper-V	Windows 2019 Server and Windows Server 2016 (Version 1607) with Hyper-V Manager (Version 10.0.14393)
Microsoft Azure	Microsoft Azure

The following table lists the supported Cisco Catalyst 9800 Series Wireless Controller hardware models.

The base PIDs are the model numbers of the controller.

The bundled PIDs indicate the orderable part numbers for the base PIDs that are bundled with a particular network module. Running the **show version**, **show module**, or **show inventory** command on such a controller (bundled PID) displays its base PID.

Note that unsupported SFPs will bring down a port. Only Cisco-supported SFPs (GLC-LH-SMD and GLC-SX-MMD) should be used on the route processor (RP) ports of C9800-80-K9 and C9800-40-K9.

Table 5: Supported PIDs and Ports

Controller Model	Description
C9800-CL-K9	Cisco Catalyst Wireless Controller as an infrastructure for cloud.
C9800-80-K9	Eight 1/10-Gigabit Ethernet SFP or SFP+ ports and two power supply slots.
C9800-40-K9	Four 1/10-Gigabit Ethernet SFP or SFP+ ports and two power supply slots.
C9800-L-C-K9	• 4x2.5/1-Gigabit ports • 2x10/5/2.5/1-Gigabit ports
C9800-L-F-K9	• 4x2.5/1-Gigabit ports • 2x10/1-Gigabit ports

The following table lists the supported SFP models.

Table 6: Supported SFPs

SFP Name	C9800-80-K9	C9800-40-K9	C9800-L-C-K9	C9800-L-F-K9
DWDM-SFP10G-30.33	Supported	Supported	—	—
DWDM-SFP10G-61.41	Supported	Supported	—	—
FINISAR-LR – FTLX1471D3BCL [1]	Supported	Supported	—	Supported
FINISAR-SR – FTLX8574D3BCL	Supported	Supported	—	Supported
GLC-BX-D	Supported	Supported	Supported	Supported
GLC-BX-U	Supported	Supported	Supported	Supported
GLC-EX-SMD	Supported	Supported	—	—
GLC-LH-SMD	Supported	Supported	Supported	—
GLC-SX-MMD	Supported	Supported	Supported	Supported
GLC-T	Supported	—	Supported	—
GLC-TE	Supported	Supported	Supported	Supported
GLC-ZX-SMD	Supported	Supported	Supported	Supported

SFP Name	C9800-80-K9	C9800-40-K9	C9800-L-C-K9	C9800-L-F-K9
QSFP-100G-LR4-S	Supported	—	—	—
QSFP-100G-SR4-S	Supported	—	—	—
QSFP-40G-BD-RX	Supported	—	—	—
QSFP-40G-ER4	Supported	—	—	—
QSFP-40G-LR4	Supported	—	—	—
QSFP-40G-LR4-S	Supported	—	—	—
QSFP-40G-SR4	Supported	—	—	—
QSFP-40G-SR4-S	Supported	—	—	—
QSFP-40GE-LR4	Supported	—	—	—
SFP-10G-AOC10M	Supported	Supported	—	—
SFP-10G-AOC1M	Supported	Supported	—	—
SFP-10G-AOC2M	Supported	Supported	—	—
SFP-10G-AOC3M	Supported	Supported	—	—
SFP-10G-AOC5M	Supported	Supported	—	—
SFP-10G-AOC7M	Supported	Supported	—	—
SFP-10G-ER	Supported	Supported	—	—
SFP-10G-LR	Supported	Supported	—	Supported
SFP-10G-LR-S	Supported	Supported	—	Supported
SFP-10G-LR-X	Supported	Supported	—	Supported
SFP-10G-LRM	Supported	Supported	—	Supported
SFP-10G-SR	Supported	Supported	—	Supported
SFP-10G-SR-S	Supported	Supported	—	Supported
SFP-10G-SR-X	Supported	Supported	—	Supported
SFP-10G-ZR	Supported	Supported	—	—
SFP-H10GB-ACU10M	Supported	Supported	—	Supported
SFP-H10GB-ACU7M	Supported	Supported	—	Supported

SFP Name	C9800-80-K9	C9800-40-K9	C9800-L-C-K9	C9800-L-F-K9
SFP-H10GB-CU1.5M	Supported	Supported	—	Supported
SFP-H10GB-CU1M	Supported	Supported	—	Supported
SFP-H10GB-CU2.5M	Supported	Supported	—	Supported
SFP-H10GB-CU2M	Supported	Supported	—	Supported
SFP-H10GB-CU3M	Supported	Supported	—	Supported
SFP-H10GB-CU5M	Supported	Supported	—	Supported

[1] The FINISAR SFPs are not Cisco specific and some of the features, such as DOM, may not work properly.

Optics Modules

The Cisco Catalyst 9800 Series Wireless Controller supports a wide range of optics. The list of supported optics is updated on a regular basis. See the tables at the following location for the latest transceiver module compatibility information:

https://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html

Network Protocols and Port Matrix

Table 7: Cisco Catalyst 9800 Series Wireless Controller - Network Protocols and Port Matrix

Source	Destination	Protocol	Destination Port	Source Port	Description
Any	Cisco Catalyst 9800 Series Wireless Controller	TCP	22	Any	SSH
Any	Cisco Catalyst 9800 Series Wireless Controller	TCP	23	Any	Telnet
Any	Cisco Catalyst 9800 Series Wireless Controller	TCP	80	Any	HTTP
Any	Cisco Catalyst 9800 Series Wireless Controller	TCP	443	Any	HTTPS

Source	Destination	Protocol	Destination Port	Source Port	Description
Any	Cisco Catalyst 9800 Series Wireless Controller	UDP	161	Any	SNMP Agent
Any	Any	UDP	5353	5353	mDNS
Any	Cisco Catalyst 9800 Series Wireless Controller	UDP	69	69	TFTP
Any	DNS Server	UDP	53	Any	DNS
Any	Cisco Catalyst 9800 Series Wireless Controller	TCP	830	Any	NetConf
Any	Cisco Catalyst 9800 Series Wireless Controller	TCP	443	Any	REST API
Any	WLC Protocol	UDP	1700	Any	Receive CoA packets.
AP	Cisco Catalyst 9800 Series Wireless Controller	UDP	5246	Any	CAPWAP Control
AP	Cisco Catalyst 9800 Series Wireless Controller	UDP	5247	Any	CAPWAP Data
AP	Cisco Catalyst 9800 Series Wireless Controller	UDP	5248	Any	CAPWAP MCAST
AP	Cisco DNA Center	UDP	57778	Any	Intelligent capture and RF telemetry
AP	AP	UDP	16670	Any	Client Policies (AP-AP)

Source	Destination	Protocol	Destination Port	Source Port	Description
Cisco Catalyst 9800 Series Wireless Controller	Cisco Catalyst 9800 Series Wireless Controller	UDP	16666	16666	Mobility Control
Cisco Catalyst 9800 Series Wireless Controller	SNMP	UDP	162	Any	SNMP Trap
Cisco Catalyst 9800 Series Wireless Controller	RADIUS	UDP	1812/1645	Any	RADIUS Auth
Cisco Catalyst 9800 Series Wireless Controller	RADIUS	UDP	1813/1646	Any	RADIUS ACCT
Cisco Catalyst 9800 Series Wireless Controller	TACACS+	TCP	49	Any	TACACS+
Cisco Catalyst 9800 Series Wireless Controller	Cisco Catalyst 9800 Series Wireless Controller	UDP	16667	16667	Mobility
Cisco Catalyst 9800 Series Wireless Controller	NTP Server	UDP	123	Any	NTP
Cisco Catalyst 9800 Series Wireless Controller	Syslog Server	UDP	514	Any	SYSLOG
Cisco Catalyst 9800 Series Wireless Controller	NetFlow Server	UDP	9996	Any	NetFlow
Cisco Catalyst 9800 Series Wireless Controller	Cisco Connected Mobile Experiences (CMX)	UDP	16113	Any	NMSP

Source	Destination	Protocol	Destination Port	Source Port	Description
Cisco Catalyst Center	Cisco Catalyst 9800 Series Wireless Controller	TCP	32222	Any	Device Discovery

Supported APs

The following Cisco APs are supported in this release.

Indoor Access Points

- Cisco Catalyst 9105AX (I) Access Points
  - VID 04 or later - supported from 17.6.4
  - VID 03 or earlier
- Cisco Catalyst 9105AX (W) Access Points
  - VID 02 or later - supported from 17.6.4
  - VID 01 or earlier
- Cisco Catalyst 9115AX (I/E) Access Points
- Cisco Catalyst 9117AX (I) Access Points
- Cisco Catalyst 9120AX (I/E) Access Points
  - VID 07 or later - supported from 17.6.4
  - VID 06 or earlier
- Cisco Catalyst 9120AX (P) Access Points
- Cisco Catalyst 9130AX (I/E) Access Points
  - VID 03 or later - supported from 17.6.4
  - VID 02 or earlier

  (For information about Cisco Catalyst 9105, 9120, or 9130 Access Points version support, see the Field Notice 72424.)
- Cisco Catalyst 9136 Access Points
- Cisco Aironet 1815 (I/W), 1830 (I), 1840 (I), and 1852 (I/E) Access Points
- Cisco Aironet 2800 (I/E) Series Access Points
- Cisco Aironet 3800 (I/E/P) Series Access Points
- Cisco Aironet 4800 Series Access Points

- Cisco Catalyst 9120AXP Access Points - supported from 16.12.2s

Outdoor Access Points

- Cisco Aironet 1540 Series Access Points
- Cisco Aironet 1560 Series Access Points
- Cisco Industrial Wireless 3700 Series Access Points
- Cisco Catalyst Industrial Wireless 6300 Heavy Duty Series Access Point
- Cisco 6300 Series Embedded Services Access Point
- Cisco Catalyst 9124AX (I/D) Access Points

Integrated Access Points

- Integrated Access Point on Cisco 1100 ISR (ISR-AP1100AC-x, ISR-AP1101AC-x, and ISR-AP1101AX-x)

Network Sensor

- Cisco Aironet 1800s Active Sensor

Pluggable Modules

- Wi-Fi 6 Pluggable Module for Industrial Routers

Supported Access Point Channels and Maximum Power Settings

Supported access point channels and maximum power settings on Cisco APs are compliant with the regulatory specifications of channels, maximum power levels, and antenna gains of every country in which the access points are sold. For more information about the supported access point transmission values in Cisco IOS XE software releases, see the *Detailed Channels and Maximum Power Settings* document at https://www.cisco.com/c/en/us/support/ios-nx-os-software/ios-xe-17/products-technical-reference-list.html.

For information about Cisco Wireless software releases that support specific Cisco AP modules, see the "Software Release Support for Specific Access Point Modules" section in the *Cisco Wireless Solutions Software Compatibility Matrix* document.

Compatibility Matrix

The following table provides software compatibility information.

Table 8: Compatibility Information

Cisco Catalyst 9800 Series Wireless Controller Software	Cisco Identity Services Engine	Cisco Prime Infrastructure	Cisco AireOS-IRCM Interoperability	Cisco Catalyst Center	Cisco Spaces: Connector	Cisco CMX
Cupertino 17.8.x	3.0 2.7 2.6 2.4	3.10 MR1	8.10.171.0 8.10.162.0 8.10.151.0 8.10.142.0 8.10.130.0 8.8.130.0 8.5.176.2 8.5.182.104	See Cisco Catalyst Center Compatibility Information	2.3.1 2.3 2.2	10.6.3

GUI System Requirements

The following subsections list the hardware and software required to access the Cisco Catalyst 9800 Controller GUI.

Table 9: Hardware Requirements

Processor Speed	DRAM	Number of Colors	Resolution	Font Size
233 MHz minimum[2]	512 MB[3]	256	1280 x 800 or higher	Small

[2] We recommend 1 GHz.
[3] We recommend 1-GB DRAM.

Software Requirements

Operating Systems:

- Windows 7 or later
- Mac OS X 10.11 or later

Browsers:

- Google Chrome: Version 59 or later (on Windows and Mac)
- Microsoft Edge: Version 40 or later (on Windows)
- Safari: Version 10 or later (on Mac)

- Mozilla Firefox: Version 60 or later (on Windows and Mac)

Note Firefox Version 63.x is not supported.

The controller GUI uses Virtual Terminal (VTY) lines for processing HTTP requests. At times, when multiple connections are open, the default number of VTY lines of 15 set by the device might get exhausted. Therefore, we recommend that you increase the number of VTY lines to 50.

To increase the VTY lines in a device, run the following commands in the following order:

1. **device#** configure terminal
2. **device(config)#** line vty 50

   A best practice is to configure the service tcp-keepalives to monitor the TCP connection to the device.
3. **device(config)#** service tcp-keepalives-in
4. **device(config)#** service tcp-keepalives-out

Before You Upgrade

Ensure that you familiarize yourself with the following points before proceeding with the upgrade:

Caution During controller upgrade or reboot, if route processor ports are connected to any Cisco switch, ensure that the route processor ports are not flapped (shut/no shut process). Otherwise, it may lead to a kernel crash.

- ISSU feature is supported only within and between major releases, for example, 17.3.x (within a release) and 17.3.x to 17.6.x (among major releases).
- Controller upgrade from Cisco IOS XE Bengaluru 17.3.x to Cisco IOS XE Bengaluru 17.6.x or Cisco IOS XE Cupertino 17.9.x or later using ISSU may fail if the **domain** command is configured. Ensure that you run the **no domain** command before starting an ISSU upgrade because the **domain** command has been removed from Cisco IOS XE Bengaluru 17.6.x.
- Controller upgrade from Cisco IOS XE Bengaluru 17.3.x to any release using ISSU may fail if the **snmp-server enable traps hsrp** command is configured. Ensure that you remove the **snmp-server enable traps hsrp** command from the configuration before starting an ISSU upgrade because the **snmp-server enable traps hsrp** command has been removed from Cisco IOS XE Bengaluru 17.4.x.
- Controller upgrade to Cisco IOS XE Dublin 17.12.x from any prior release using ISSU may fail if the **snmp-server enable traps license** command is configured. Ensure that you remove the **snmp-server enable traps license** command from the configuration before starting an ISSU upgrade because the **snmp-server enable traps license** command has been removed from Cisco IOS XE Dublin 17.12.x.
- Ensure that you add Authentication and Key Management (AKM) setting when you configure WPA3. In older releases, this scenario was not mandatory which resulted in an invalid configuration. However, from 17.9 and higher releases, this invalid scenario is detected and prevented.

Wave 2 APs may get into a boot loop when upgrading software over a WAN link. For more information, see: https://www.cisco.com/c/en/us/support/docs/wireless/catalyst-9800-series-wireless-controllers/220443-how-to-avoid-boot-loop-due-to-corrupted.html.

The following Wave 1 APs are not supported from 17.4 to 17.9.2, 17.10.x, 17.11.x, and 17.13.x:

- **Cisco Aironet 1570 Series Access Point**
- **Cisco Aironet 1700 Series Access Point**
- **Cisco Aironet 2700 Series Access Point**
- **Cisco Aironet 3700 Series Access Point**

Note

- Support for the above APs was reintroduced from Cisco IOS XE Cupertino 17.9.3.
- Support for these APs does not extend beyond the normal product lifecycle support. Refer to the individual End-of-Support bulletins on Cisco.com.
- Feature support is on parity with the 17.3.x release. Features introduced in 17.4.1 or later are not supported on these APs in the 17.9.3 release.
- You can migrate directly to 17.9.3 from 17.3.x, where x=4c or later.

- From Cisco IOS XE Dublin 17.10.x, Key Exchange and MAC algorithms like diffie-hellman-group14-sha1, hmac-sha1, hmac-sha2-256, and hmac-sha2-512 are not supported by default and it may impact some SSH clients that only support these algorithms. If required, you can add them manually. For information on manually adding these algorithms, see the **SSH Algorithms for Common Criteria Certification** document available at: https://www.cisco.com/c/en/us/td/docs/routers/ios/config/17-x/sec-vpn/b-security-vpn/m_sec-secure-shell-algorithm-ccc.html
- If APs fail to detect the backup image after running the **archive download-sw** command, perform the following steps:

  1. Upload the image using the **no-reload** option of the **archive download-sw** command:

     ```
     Device# archive download-sw /no-reload tftp://<tftp_server_ip>/<image_name>
     ```

  2. Restart the CAPWAP process using **capwap ap restart** command. This allows the AP to use the correct backup image after the restart (reload is not required.)

     ```
     Device# capwap ap restart
     ```

Caution The AP will lose connection to the controller during the join process. When the AP joins the new controller, it will see a new image in the backup partition. So, the AP will not download a new image from the controller.

- You might observe a high Confd CPU when full synchronization occurs between NETCONF datastore and Cisco IOS configuration. This behavior is normal and is triggered by the **line vty** command.
- From Cisco IOS XE Cupertino 17.7.1 onwards, for Cisco Catalyst 9800-CL Wireless Controller, ensure that you complete Resource Utilization Measurement (RUM) reporting and ensure that the ACK is made

available on the product instance at least once. This is to ensure that correct and up-to-date usage information is reflected in the Cisco Smart Software Manager (CSSM).

- From Cisco IOS XE Amsterdam 17.3.1 onwards, the Cisco Catalyst 9800-CL Wireless Controller requires 16 GB of disk space for new deployments.

  If you are upgrading to Cisco IOS XE Amsterdam 17.3.x from a previous release, resizing of disk space is not supported. If the current disk space is lesser than 16 GB, you need to redeploy the VM to meet the new disk space requirements.

- Fragmentation lower than 1500 is not supported for the RADIUS packets generated by wireless clients in the Gi0 (OOB) interface.

- Cisco IOS XE allows you to encrypt all the passwords used on the device. This includes user passwords and SSID passwords (PSK). For more information, see the "Password Encryption" section of the Cisco Catalyst 9800 Series Configuration Best Practices document.

- While upgrading to Cisco IOS XE 17.3.x and later releases, if the **ip http active-session-modules none** command is enabled, you will not be able to access the controller GUI using HTTPS. To access the GUI using HTTPS, run the following commands in the order specified below:

  1. **ip http session-module-list pkilist OPENRESTY_PKI**
  2. **ip http active-session-modules pkilist**

- Cisco Aironet 1815T OfficeExtend Access Point will be in local mode when connected to the controller. However, when it functions as a standalone AP, it gets converted to FlexConnect mode.

- The Cisco Catalyst 9800-L Wireless Controller may fail to respond to the BREAK signals received on its console port during boot time, preventing users from getting to the ROMMON. This problem is observed on the controllers manufactured until November 2019, with the default config-register setting of 0x2102. This problem can be avoided if you set config-register to 0x2002. This problem is fixed in the 16.12(3r) ROMMON for Cisco Catalyst 9800-L Wireless Controller. For information about how to upgrade the ROMMON, see the Upgrading ROMMON for Cisco Catalyst 9800-L Wireless Controllers section of the Upgrading Field Programmable Hardware Devices for Cisco Catalyst 9800 Series Wireless Controllers document.

- By default, the controller uses a TFTP block size value of 512, which is the lowest possible value. This default setting is used to ensure interoperability with legacy TFTP servers. If required, you can change the block size value to 8192 to speed up the transfer process, using the **ip tftp blocksize** command in global configuration mode.

- We recommend that you configure the **password encryption aes** and the **key config-key password-encrypt** *key* commands to encrypt your password.

- If the following error message is displayed after a reboot or system crash, we recommend that you regenerate the trustpoint certificate:

  ```
  ERR_SSL_VERSION_OR_CIPHER_MISMATCH
  ```

  Use the following commands in the order specified below to generate a new self-signed trustpoint certificate:

  1. device# configure terminal
  2. device(config)# **no crypto pki trustpoint** *trustpoint_name*
  3. device(config)# **no ip http server**

4. device(config)# **no ip http secure-server**
5. device(config)# **ip http server**
6. device(config)# **ip http secure-server**
7. device(config)# **ip http authentication** *local/aaa*

- Do not deploy OVA files directly to VMware ESXi 6.5. We recommend that you use an OVF tool to deploy the OVA files.
- Ensure that you remove the controller from Cisco Prime Infrastructure before disabling or enabling Netconf-YANG. Otherwise, the system may reload unexpectedly.
- Unidirectional Link Detection (UDLD) protocol is not supported.
- SIP media session snooping is not supported on FlexConnect local switching deployments.
- The Cisco Catalyst 9800 Series Wireless Controllers (C9800-CL, C9800-L, C9800-40, and C9800-80) support a maximum of 14,000 leases with internal DHCP scope.
- Configuring the mobility MAC address using the **wireless mobility mac-address** command is mandatory for both HA and 802.11r.
- If you have Cisco Catalyst 9120 (E/I/P) and Cisco Catalyst 9130 (E) APs in your network and you want to downgrade, use only Cisco IOS XE Gibraltar 16.12.1t. Do not downgrade to Cisco IOS XE Gibraltar 16.12.1s.
- The following SNMP variables are not supported:
  - CISCO-LWAPP-WLAN-MIB: cLWlanMdnsMode
  - CISCO-LWAPP-AP-MIB.my: cLApDot11IfRptncPresent, cLApDot11IfDartPresent
- If you are upgrading from Cisco IOS XE Gibraltar 16.11.x or an earlier release, ensure that you unconfigure the *advipservices* boot-level licenses on both the active and standby controllers using the **no license boot level advipservices** command before the upgrade. Note that the **license boot level advipservices** command is not available in Cisco IOS XE Gibraltar 16.12.1s and 16.12.2s.
- The Cisco Catalyst 9800 Series Wireless Controller has a service port that is referred to as *GigabitEthernet 0* port.

  The following protocols and features are supported through this port:
  - Cisco Catalyst Center
  - Cisco Smart Software Manager
  - Cisco Prime Infrastructure
  - Telnet
  - Controller GUI
  - DNS
  - File transfer
  - GNMI

- HTTP
- HTTPS
- LDAP
- Licensing for Smart Licensing feature to communicate with CSSM
- Netconf
- NetFlow
- NTP
- RADIUS (including CoA)
- Restconf
- SNMP
- SSH
- SYSLOG
- TACACS+

- During device upgrade using GUI, if a switchover occurs, the session expires and the upgrade process gets terminated. As a result, the GUI cannot display the upgrade state or status.
- From Cisco IOS XE Bengaluru 17.4.1 onwards, the telemetry solution provides a name for the receiver address instead of the IP address for telemetry data. This is an additional option. During the controller downgrade and subsequent upgrade, there is likely to be an issue—the upgrade version uses the newly named receivers, and these are not recognized in the downgrade. The new configuration gets rejected and fails in the subsequent upgrade. Configuration loss can be avoided when the upgrade or downgrade is performed from Cisco Catalyst Center.
- From Cisco IOS XE Bengaluru 17.4.1 onwards, session timeout under the policy profile is supported.
- Communication between Cisco Catalyst 9800 Series Wireless Controller and Cisco Prime Infrastructure uses different ports:
  - All the configurations and templates available in Cisco Prime Infrastructure are pushed through SNMP and CLI, using UDP port 161.
  - Operational data for controller is obtained over SNMP, using UDP port 162.
  - AP and client operational data leverage streaming telemetry:
    - Cisco Prime Infrastructure to controller: TCP port 830 is used by Cisco Prime Infrastructure to push the telemetry configuration to the controller (using NETCONF).
    - Controller to Cisco Prime Infrastructure: TCP port 20828 is used for Cisco IOS-XE 16.10.x and 16.11.x, and TCP port 20830 is used for Cisco IOS-XE 16.12.x, 17.1.x and later releases.
- To migrate public IP address from 16.12.x to 17.x. ensure that you configure the **service internal** command. If you do not configure the **service internal** command, the IP address does not get carried forward.
- RLAN support with Virtual Routing and Forwarding (VRF) is not available.

- When you encounter the SNMP error *SNMP_ERRORSTATUS_NOACCESS 6*, it means that the specified SNMP variable is not accessible.
- We recommend that you perform a controller reload whenever there is a change in the controller's clock time to reflect an earlier time.

Note The DTLS version (DTLSv1.0) is deprecated for Cisco Aironet 1800 based on latest security policies. Therefore, any new out-of-box deployments of Cisco Aironet 1800 APs will fail to join the controller and you will get the following error message:

```
%APMGR_TRACE_MESSAGE-3-WLC_GEN_ERR: Chassis 1 R0/2: wncd: Error in AP Join, AP <AP-name>,
mac:<MAC-address>Model AIR-AP1815W-D-K9, AP negotiated unexpected DTLS version v1.0
```

To onboard new Cisco Aironet 1800 APs and to establish a CAPWAP connection, explicitly set the DTLS version to 1.0 in the controller using the following configuration:

```
config terminal
ap dtls-version dtls_1_0
end
```

Note that setting the DTLS version to 1.0 affects all the existing AP CAPWAP connections. We recommend that you apply the configuration only during a maintenance window. After the APs download the new image and join the controller, ensure that you remove the configuration.

Important Before you begin a downgrade process, you must manually remove the configurations which are applicable in the current version but not in older version. Otherwise, you might encounter an unexpected behavior.

Upgrade Path to Cisco IOS XE Cupertino 17.8.x

Table 10: Upgrade Path to Cisco IOS XE Cupertino 17.8.x

Current Software	Upgrade Path for Deployments with 9130 or 9124	Upgrade Path for Deployments Without 9130 or 9124
16.10.x	—	Upgrade first to 16.12.5 or 17.3.x and then to 17.8.x.
16.11.x	—	Upgrade first to 16.12.5 or 17.3.x and then to 17.8.x.
16.12.x	Upgrade first to 17.3.4c or later and then to 17.8.x.	Upgrade directly to 17.8.x.
17.1.x	Upgrade first to 17.3.4c or later and then to 17.8.x.	Upgrade first to 17.3.x and then to 17.8.x.
17.2.x	Upgrade first to 17.3.4c or later and then to 17.8.x.	Upgrade first to 17.3.x and then to 17.8.x.

Current Software	Upgrade Path for Deployments with 9130 or 9124	Upgrade Path for Deployments Without 9130 or 9124
17.3.1 to 17.3.4	Upgrade first to 17.3.4c or later and then to 17.8.x.	Upgrade directly to 17.8.x.
17.3.4c or later	Upgrade directly to 17.8.x.	Upgrade directly to 17.8.x.
17.4.x	Upgrade first to 17.6.x and then to 17.8.x.	Upgrade first to 17.6.x and then to 17.8.x.
17.5.x	Upgrade first to 17.6.x and then to 17.8.x.	Upgrade first to 17.6.x and then to 17.8.x.
17.6.x	Upgrade directly to 17.8.x.	Upgrade directly to 17.8.x.
17.7.x	Upgrade first to 17.3.5 and then to 17.8.x.	Upgrade directly to 17.8.x.

Upgrading the Controller Software

This section describes the various aspects of upgrading the controller software.

For information on the upgrade process and the methods to upgrade the Cisco Catalyst 9800 Series Wireless Controller software, see the "Upgrading the Cisco Catalyst 9800 Wireless Controller Software" chapter of the Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide.

Finding the Software Version

The package files for the Cisco IOS XE software are stored in the system board flash device (flash:).

Use the **show version** privileged EXEC command to see the software version that is running on your controller.

Note Although the **show version** output always shows the software image running on the controller, the model name shown at the end of the output is the factory configuration, and does not change if you upgrade the software license.

Use the **show install summary** privileged EXEC command to see the information about the active package.

Use the **dir** *filesystem:* privileged EXEC command to see the directory names of other software images that you have stored in flash memory.

Software Images

- **Release**: Cisco IOS XE Cupertino 17.8.x
- **Image Names (9800-80, 9800-40, and 9800-L)**:
  - C9800-80-universalk9_wlc.17.08.x.SPA.bin
  - C9800-40-universalk9_wlc.17.08.x.SPA.bin

- C9800-L-universalk9_wlc.17.08.x.SPA.bin

- **Image Names (9800-CL)**:
  - **Cloud**: C9800-CL-universalk9.17.08.x.SPA.bin
  - **Hyper-V/ESXi/KVM**: C9800-CL-universalk9.17.08.x.iso, C9800-CL-universalk9.17.08.x.ova
  - **KVM**: C9800-CL-universalk9.17.08.x.qcow2
  - **NFVIS**: C9800-CL-universalk9.17.08.x.tar.gz

Software Installation Commands

Cisco IOS XE, Cupertino, 17.8.x	
To install and activate a specified file, and to commit changes to be persistent across reloads, run the following command: **device# install add file** *filename* **[activate |commit]** To separately install, activate, commit, end, or remove the installation file, run the following command: **device# install ?** **Note** We recommend that you use the GUI for installation.	
add file tftp: *filename*	Copies the install file package from a remote location to a device, and performs a compatibility check for the platform and image versions.
activateauto-abort-timer]	Activates the file and reloads the device. The **auto-abort-timer** keyword automatically rolls back image activation.
commit	Makes changes that are persistent over reloads.
rollback to committed	Rolls back the update to the last committed version.
abort	Cancels file activation, and rolls back to the version that was running before the current installation procedure started.
remove	Deletes all unused and inactive software installation files.

Licensing

The Smart Licensing Using Policy feature is automatically enabled on the controller. This is also the case when you upgrade to this release. By default, your Smart Account and Virtual Account in Cisco Smart Software Manager (CSSM) are enabled for Smart Licensing Using Policy. For more information, see the "Smart Licensing Using Policy" chapter in the Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide.

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

Interoperability with Clients

This section describes the interoperability of the controller software with client devices.

The following table lists the configurations used for testing client devices.

Table 11: Test Configuration for Interoperability

Hardware or Software Parameter	Hardware or Software Type
Release	Cisco IOS XE, Cupertino, 17.8.x
Cisco Wireless Controller	See Supported Hardware, on page 8.
Access Points	See Supported APs.
Radio	• 802.11ax • 802.11ac • 802.11a • 802.11g • 802.11n • 802.11ax in 6GHz (Wi-Fi 6E)
Security	Open, PSK (WPA2-AES), 802.1X (WPA2-AES) (EAP-FAST, EAP-TLS) 802.11ax
RADIUS	See Compatibility Matrix, on page 16.
Types of tests	Connectivity, traffic (ICMP), and roaming between two APs

The following table lists the client types on which the tests were conducted. Client types included laptops, hand-held devices, phones, and printers.

Table 12: Client Types

Client Type and Name	Driver or Software Version
Laptops	
Acer Aspire E 15 E5-573-3870 (Qualcomm Atheros QCA9377)	Windows 10 Pro (12.0.0.832)
Apple Macbook Air 11 inch	OS Sierra 10.12.6
Apple Macbook Air 13 inch	OS High Sierra 10.13.4
Macbook Pro Retina	OS Catalina
Macbook Pro Retina 13 inch early 2015	OS Mojave 10.14.3
Macbook Pro OS X	OS X 10.8.5

Client Type and Name	Driver or Software Version
Macbook Air	OS Sierra v10.12.2
Macbook Air 11 inch	OS X Yosemite 10.10.5
MacBook M1 Chip	OS Catalina
Dell Inspiron 2020 Chromebook	Chrome OS 75.0.3770.129
Google Pixelbook Go	Chrome OS 97.0.4692.27
HP chromebook 11a	Chrome OS 76.0.3809.136
Samsung Chromebook 4+	Chrome OS 77.0.3865.105
Dell Latitude (Intel AX210)	Windows 11 (22.110.x.x)
Dell Latitude 3480 (Qualcomm DELL wireless 1820)	Win 10 Pro (12.0.0.242)
Dell Inspiron 15-7569 (Intel Dual Band Wireless-AC 3165)	Windows 10 Home (21.40.0)
Dell Latitude E5540 (Intel Dual Band Wireless AC7260)	Windows 7 Professional (21.10.1)
Dell Latitude E5430 (Intel Centrino Advanced-N 6205)	Windows 7 Professional (15.18.0.1)
Dell Latitude E6840 (Broadcom Dell Wireless 1540 802.11 a/g/n)	Windows 7 Professional (6.30.223.215)
Dell XPS 12 v9250 (Intel Dual Band Wireless AC 8260)	Windows 10 Home (21.40.0)
Dell Latitude 5491 (Intel AX200)	Windows 10 Pro (21.20.1.1)
Dell XPS Latitude12 9250 (Intel Dual Band Wireless AC 8260)	Windows 10 Home
Dell Inspiron 13-5368 Signature Edition	Windows 10 Home (18.40.0.12)
FUJITSU Lifebook E556 Intel 8260 (Intel Dual Band Wireless-AC 8260 (802.11n))	Windows 8 (19.50.1.6)
Lenovo Yoga C630 Snapdragon 850 (Qualcomm AC 2x2 Svc)	Windows 10 Home
Lenovo Thinkpad Yoga 460 (Intel Dual Band Wireless-AC 9260)	Windows 10 Pro (21.40.0)
Note For clients using Intel wireless cards, we recommend that you to update to the latest Intel wireless drivers if the advertised SSIDs are not visible.	
Tablets	
Apple iPad 2021	iOS 15.0
Apple iPad 7the Gen 2019	iOS 14.0

Client Type and Name	Driver or Software Version
Apple iPad MD328LL/A	iOS 9.3.5
Apple iPad 2 MC979LL/A	iOS 11.4.1
Apple iPad Air MD785LL/A	iOS 11.4.1
Apple iPad Air2 MGLW2LL/A	iOS 10.2.1
Apple iPad Mini 4 9.0.1 MK872LL/A	iOS 11.4.1
Apple iPad Mini 2 ME279LL/A	iOS 11.4.1
Apple iPad Mini 4 9.0.1 MK872LL/A	iOS 11.4.1
Microsoft Surface Pro 3 13 inch (Intel AX201)	Windows 10 (21.40.1.3)
Microsoft Surface Pro 3 15 inch (Qualcomm Atheros QCA61x4A)	Windows 10
Microsoft Surface Pro 7 (Intel AX201)	Windows 10
Microsoft Surface Pro 6 (Marvell Wi-Fi chipset 11ac)	Windows 10
Microsoft Surface Pro X (WCN3998 Wi-Fi Chip)	Windows
Mobile Phones	
Apple iPhone 5	iOS 12.4.1
Apple iPhone 6s	iOS 13.5
Apple iPhone 7 MN8J2LL/A	iOS 11.2.5
Apple iPhone 8	iOS 13.5
Apple iPhone 8 Plus	iOS 14.1
Apple iPhone 8 Plus MQ8D2LL/A	iOS 12.4.1
Apple iPhone X MQA52LL/A	iOS 13.1
Apple iPhone 11	iOS 15.1
Apple iPhone 12	iOS 15.1
Apple iPhone 12 Pro	iOS 15.1
Apple iPhone 13	iOS 15.1
Apple iPhone 13 Mini	iOS 15.1
Apple iPhone 13 Pro	iOS 15.1
Apple iPhone SE MLY12LL/A	iOS 11.3
Apple iPhone SE	iOS 15.1
ASCOM i63	Build v 3.0.0
ASCOM Myco 3	Android 9
Cisco IP Phone 8821	11.0.6 SR1

Client Type and Name	Driver or Software Version
Drager Delta	VG9.0.2
Drager M300.3	VG2.4
Drager M300.4	VG2.4
Drager M540	DG6.0.2 (1.2.6)
Google Pixel 3a	Android 11
Google Pixel 4	Android 11
Google Pixel 5	Android 11
Google Pixel 6	Android 11
Huawei Mate 20 pro	Android 9.0
Huawei P20 Pro	Android 10
Huawei P40	Android 10
LG v40 ThinQ	Android 9.0
One Plus 8	Android 11
Oppo Find X2	Android 10
Redmi K20 Pro	Android 10
Samsung Galaxy S9+ - G965U1	Android 10.0
Samsung Galaxy S10 Plus	Android 11.0
Samsung S10 (SM-G973U1)	Android 11.0
Samsung S10e (SM-G970U1)	Android 11.0
Samsung S20 Ultra	Android 10.0
Samsung S21 Ultra 5G	Android 11.0
Samsung Fold 2	Android 10.0
Samsung Note20	Android 10.0
Samsung G Note 10 Plus	Android 11.0
Samsung Galaxy A01	Android 11.0
Samsung Galaxy A21	Android 10.0
Sony Experia 1 ii	Android 11
Sony Experia	Android 11
Xiaomi Mi 9T	Android 9

Client Type and Name	Driver or Software Version
Xiaomi Mi 10	Android 11
Spectralink 84 Series	7.5.0.x257
Spectralink 87 Series	Android 5.1.1
Spectralink Versity Phones 92/95/96 Series	Android 10.0
Vocera Badges B3000n	4.3.3.18
Vocera Smart Badges V5000	5.0.6.35
Zebra MC40	Android 4.4.4
Zebra MC40N0	Android 4.1.1
Zebra MC92N0	Android 4.4.4
Zebra MC9090	Windows Mobile 6.1
Zebra MC55A	Windows 6.5
Zebra MC75A	OEM ver 02.37.0001
Zebra TC51	Android 6.0.1
Zebra TC52	Android 10.0
Zebra TC55	Android 8.1.0
Zebra TC57	Android 10.0
Zebra TC70	Android 6.1
Zebra TC75	Android 10.0
Zebra TC8000	Android 4.4.3
Printers	
Zebra QLn320 Mobile Printer	LINK OS 5.2
Zebra ZT230 IndustrialPrinter	LINK OS 6.4
Zebra ZQ310 Mobile Printer	LINK OS 6.4
Zebra ZD410 Industrial Printer	LINK OS 6.4
Zebra ZT410 Desktop Printer	LINK OS 6.4
Zebra ZQ610 Industrial Printer	LINK OS 6.4
Zebra ZQ620 Mobile Printer	LINK OS 6.4
Wireless Module	
Intel 11ax 200	Driver v22.20.0
Intel AC 9260	Driver v21.40.0
Intel Dual Band Wireless AC 8260	Driver v19.50.1.6

Client Type and Name	Driver or Software Version
Intel AX 210	Driver v22.110.x.x (or above)
Samsung S21 Ultra	Driver v20.80.80
QCA WCN6855	Driver v1.0.0.901

Caveats

Caveats describe unexpected behavior in Cisco IOS releases in a product. Caveats that are listed as Open in a prior release are carried forward to the next release as either Open or Resolved.

Note All incremental releases contain fixes from the current release.

Cisco Bug Search Tool

The Cisco Bug Search Tool (BST) allows partners and customers to search for software bugs based on product, release, and keyword, and aggregates key data such as bug details, product, and version. The BST is designed to improve the effectiveness in network risk management and device troubleshooting. The tool has a provision to filter bugs based on credentials to provide external and internal bug views for the search input.

To view the details of a caveat, click the corresponding identifier.

Open Caveats for Cisco IOS XE, Cupertino, 17.8.1

Caveat ID	Description
CSCwa31604	AP ethernet link is not stable when port speed is set to auto.
CSCwa54943	Cisco Aironet 1810 AP restarts abnormally on the controller due to out of memory.
CSCwa57643	Cisco Aironet 4802 AP is crashing with FIQ/NMI reset.
CSCwa75556	Device reloads unexpectedly due to IAPP when receiving IAPP TLV with a header type of 4.
CSCwa99904	Controller deletes client when DHCP release is sent by client during posture.
CSCwb05551	Cisco Catalyst 9100 AP is crashing with no coredumps.
CSCwb17255	The **show aaa servers** command output shows WNCD platform state as DEAD.
CSCwa80968	Cisco Catalyst 9120 AP flaps for the first time when calendar is applied due to Ethernet speed rule getting applied.

Caveat ID	Description
CSCwb42121	Cisco Catalyst 9800-40 controller shows aaa-server state as up even though aaa-server is down.
CSCwb01752	XOR radio is displaying Radio Type as "802.11ax - 2.4/5 GHz".
CSCwb10265	Cisco Catalyst 9120 AP fails to forward traffic to wireless client for about 60 seconds.
CSCwb21141	WLAN configuration is not pushed to APs on specific wncd.
CSCwb32121	Cisco Aironet 1832 AP reloads unexpectedly due to radio failure.
CSCwb36531	Cisco Catalyst 9130 AP is not able to process fragmented EAP frames from client when doing EAP-TLS.
CSCwa33537	Cisco Catalyst 9117AX AP radio reloads unexpectedly due to partial command issues.
CSCwa88777	1-2% nano write error on Kioxia Nand.
CSCwb01500	Tx power of an AP shows incorrect value on AP iCAP Radio 1 page.
CSCwb15031	Client is not able to pass traffic after roaming using WPA2 OKC.
CSCwb31470	No data for certain parameters in APs in Cisco DNA-C.
CSCwb36787	Cisco Aironet 2802 AP fails to download image from the controller.
CSCwb37749	Show spectrum operation status for 6-GHz is down.
CSCwb38238	Guest-anchor: Syslog is misleading when IP DHCP required config mismatch.
CSCwb42262	Cisco Catalyst 9124AX AP took longer time to change to static IP; CAPWAP DTLS teardown is also observed.
CSCwb43531	Cisco Catalyst 9136AXI AP: Temp sensor is reporting incorrect temperature at some conditions.
CSCwa44152	Rogue detection/containment debug with BSSID filter option is not working.
CSCwb18549	AP power policy: Update ethernet speed in the **show** command output; also update ethernet speed status reporting to the controller.

Resolved Caveats for Cisco IOS XE, Cupertino, 17.8.1

Caveat ID	Description
CSCwb06831	For Basic Service Set (BSS) coloring, controller webUI is showing mismatch between controller side and AP side.

Caveat ID	Description
CSCwa34086	Multicast Domain Name System (mDNS) cache details shows default mDNS policy for wired services instead of custom mDNS policy.
CSCwa37963	Unable to add more than one MAC address starting with 000 in wired service filter.
CSCwa84536	6-GHz: AP is not responding to some probes from Samsung and Intel clients.
CSCwa38466	Client stays in web authentication state when moves from FlexConnect central authentication to FlexConnect local authentication.
CSCwa38566	Memory leak is observed on the controller.
CSCwa34872	Memory leak is observed on the controller.
CSCvz82550	Perform the configured action or alarm only when APs hit high CPU or memory usage.
CSCvz90902	Cisco Catalyst 9130 AP: Probe suppression for macro-micro cell client steering is not working.
CSCwb08245	Cisco Catalyst 9136 AP: Firmware crash is observed.
CSCvz38425	Remove audit data option from link latency in AP Profile feature.
CSCwa35350	AP flaps when WNCd to which it maps report high CPU utilization.
CSCvz86070	Controller crashes after 11i-fast inter-wncd roam with aaa-override.
CSCvz36463	Cisco Catalyst 9130 AP: The AP flashes insufficient power LED when USB is enabled on PoE+ Switch.
CSCvz91097	Cisco Catalyst 9130 AP: RADIUS TTLS method authentication failure is observed.
CSCwa25860	Cisco Catalyst 9130 AP: Special SNMP community ID causes device to reboot.
CSCwa40959	Cisco Catalyst 9136 AP: Google Remote Procedure Call (gRPC) server crash is observed.
CSCwa46095	Cisco Catalyst 9136 AP: Disable digital predistorter (DPD) on 2.4 and 5-GHz.
CSCwa64110	Cisco Catalyst 9136 AP: AP displays HT rates for 6-GHz radio.
CSCwa86715	Cisco Catalyst 9136 AP: There is a 20 db delta between Neighbor Discovery Protocol (NDP) and beacon TX power for 6-GHz.

Caveat ID	Description
CSCwa19369	Cisco Catalyst 9136 AP: Association for HE-6E client on 2.4 and 5-GHz is wrongly showing as HE-6E instead of HE.
CSCwa91374	Cisco Catalyst 9136 AP: Auto-rf on the controller is reporting much higher interference on 2.4- GHz band than the actual traffic.
CSCwa92249	Cisco Catalyst 9136 AP: Beacon is stuck on radio 3.
CSCwb05110	mDNS wired-filter changes are not working.
CSCwa65724	Memory leak and Linux IOSd core are observed on the standby controller.
CSCvz46914	Cisco OfficeExtend Access Point (OEAP) webUI username or password is reset to default when *oeap provisioning-ssid* is disabled.
CSCwa70455	Cisco OEAP is not able to restore client filtering rules from the backup file.
CSCvz88475	Disable target wake time (TWT) and TWT broadcast by default.

Troubleshooting

For the most up-to-date, detailed troubleshooting information, visit the Cisco TAC website at:

https://www.cisco.com/c/en/us/support/docs/wireless/catalyst-9800-series-wireless-controllers/213949-wireless-debugging-and-log-collection-on.html

Go to **Product Support** and select your product from the list or enter the name of your product. Look under **Troubleshoot and Alerts** to find information about the problem that you are experiencing.

Related Documentation

Information about Cisco IOS XE is available at:

https://www.cisco.com/c/en/us/products/ios-nx-os-software/ios-xe/index.html

Cisco Validated Design documents are available at:

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

To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use the Cisco MIB Locator at:

http://www.cisco.com/go/mibs

Cisco Wireless Controller

For more information about the Cisco wireless controller, lightweight APs, and mesh APs, see these documents:

- Cisco Wireless Solutions Software Compatibility Matrix

- Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide
- Cisco Catalyst 9800 Series Wireless Controller Command Reference
- Cisco Catalyst 9800 Series Configuration Best Practices
- In-Service Software Upgrade Matrix
- Upgrading Field Programmable Hardware Devices for Cisco Catalyst 9800 Series Wireless Controllers

The installation guide for your controller is available at:

- Hardware Installation Guides

For all Cisco Wireless Controller software-related documentation, see:

https://www.cisco.com/c/en/us/support/wireless/catalyst-9800-series-wireless-controllers/tsd-products-support-series-home.html

Cisco Catalyst 9800 Wireless Controller Data Sheets

- Cisco Catalyst 9800-CL Wireless Controller: https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9800-cl-wireless-controller-cloud/nb-06-cat9800-cl-cloud-wirel-data-sheet-ctp-en.html
- Cisco Catalyst 9800-80 Wireless Controller: https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9800-series-wireless-controllers/nb-06-cat9800-80-wirel-mod-data-sheet-ctp-en.html
- Cisco Catalyst 9800-40 Wireless Controller: https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9800-series-wireless-controllers/nb-06-cat9800-wirel-cont-data-sheet-ctp-en.html
- Cisco Catalyst 9800-L Wireless Controller: https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9800-series-wireless-controllers/datasheet-c78-742434.html

Cisco Embedded Wireless Controller on Catalyst Access Points

For more information about the Cisco Embedded Wireless Controller on Catalyst Access Points, see:

https://www.cisco.com/c/en/us/support/wireless/embedded-wireless-controller-catalyst-access-points/tsd-products-support-series-home.html

Wireless Products Comparison

- Use this tool to compare the specifications of Cisco wireless APs and controllers:

  https://www.cisco.com/c/en/us/products/wireless/wireless-lan-controller/product-comparison.html

- Wireless LAN Compliance Lookup:

  https://www.cisco.com/c/dam/assets/prod/wireless/wireless-compliance-tool/index.html

- Cisco AireOS to Cisco Catalyst 9800 Wireless Controller Feature Comparison Matrix:

  https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-8/AireOS_Cat_9800_Feature_Comparison_Matrix.html

Cisco Access Points–Statement of Volatility

The STATEMENT OF VOLATILITY is an engineering document that provides information about the device, the location of its memory components, and the methods for clearing device memory. Refer to the data security policies and practices of your organization and take the necessary steps required to protect your devices or network environment.

The Cisco Aironet and Catalyst AP Statement of Volatility (SoV) documents are available on Cisco Trust Portal at https://trustportal.cisco.com/c/r/ctp/trust-portal.html#/.

You can search by the AP model to view the SoV document.

Cisco Prime Infrastructure

Cisco Prime Infrastructure Documentation

Cisco Connected Mobile Experiences

Cisco Connected Mobile Experiences Documentation

Cisco Catalyst Center

Cisco Catalyst Center Documentation

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.