



Release Notes for Cisco Catalyst 9800 Series Wireless Controller, Cisco IOS XE Cupertino 17.7.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 (HA) 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 Digital Network Architecture (DNA) 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 17.7.1

Table 1: New and Modified Software Features

Feature Name	Description and Documentation Link
6-GHz Client Steering Support in Cisco Catalyst 9136I Access Points	<p>From Cisco IOS XE Cupertino 17.7.1 onwards, 6-GHz client steering is supported on Cisco Catalyst 9136I Access Points.</p> <p>6-GHz client steering takes place when the controller receives a periodic client statistics report from a 2.4-GHz band or the 5-GHz band. The client-steering configuration is enabled under WLAN, and is configured only for clients that are 6-GHz capable. If a client in the report is 6-GHz capable, then client steering is triggered, and the client is steered to the 6-GHz band.</p> <p>The following commands are introduced:</p> <ul style="list-style-type: none"> • client-steering • wireless client client-steering client-count • wireless client client-steering window-size • wireless client client-steering util-threshold • wireless client client-steering min-rssi-24ghz -70 • wireless client client-steering min-rssi-5ghz -75 <p>For more information, see the chapter 6-GHz Band Operations.</p>
6-GHz Radio Band Support in Cisco Catalyst 9136I Access Points	<p>From Cisco IOS XE Cupertino 17.7.1 onwards, Cisco Catalyst 9136I Access Points support the 6-GHz radio band.</p> <p>The following commands are introduced:</p> <ul style="list-style-type: none"> • channel psc • dot11ax bcast-probe-response time-interval • dot11ax fils-discovery • dot11ax multi-bssid-profile • dot11ax {downlink-mumimo downlink-ofdma target-waketime twt-broadcast uplink-mumimo uplink-ofdma}

Feature Name	Description and Documentation Link
Ciphersuite Selection for Local EAP Authentication	<p>From Cisco IOS XE Cupertino 17.7.1 onwards, the controller is equipped with a knob that controls the list of ciphersuites when using local authentication.</p> <p>For more information, see the chapter Local EAP Ciphersuite.</p>
Cisco AI Enhanced RRM	<p>AI-enhanced Radio Resource Management (RRM) is the latest in Cisco's award winning RRM.</p> <p>AI-enhanced RRM is coordinated through Cisco's DNA Center (on-prem appliance) as a service. The current RRM sites are seamlessly transitioned to an intelligent and centralized service. AI-enhanced RRM, along with other Cisco DNA Center services, brings a host of new features with it.</p> <p>For more information, see the chapter Radio Resource Management.</p>
Cisco OEAP Split Tunneling	<p>The split tunneling feature in Cisco OfficeExtend Access Point (OEAP) provides a mechanism to classify client traffic, based on packet content, using access control lists (ACLs).</p> <p>The following command is introduced:</p> <ul style="list-style-type: none"> • show split-tunnel client access-list <p>For more information, see the chapter Cisco OEAP Split Tunneling.</p>
Coexistence of Intelligent Capture (iCAP) or IoT Services - Dual gRPC Channel	<p>From Cisco IOS XE Cupertino 17.7.1, IoT Services and Intelligent Capture (iCAP) port configurations are allowed to co-exist. That is, when both IoT Services and iCAP features are enabled on the controller, there will be two gRPC connections from the corresponding AP.</p> <p>The following are the gRPC connections from AP:</p> <ul style="list-style-type: none"> • One gRPC connection from AP to Cisco DNA Center for iCAP. • Another gRPC connection from AP to Cisco DNA Spaces Connector for IoT services. <p>For more information, see the chapter IoT Services Management.</p>
Configure Customized String in NAS-ID	<p>Network access server identifier (NAS-ID) is used to notify the source of a RADIUS access request, which enables the RADIUS server to choose a policy for that request. You can configure one on each WLAN profile, VLAN interface, or access point group.</p> <p>The following command is modified:</p> <ul style="list-style-type: none"> • nas-id <p>For more information, see the chapter Network Access Server Identifier.</p>

Feature Name	Description and Documentation Link
Converting IOS Commands to XML	<p>This feature helps to automatically translate Cisco IOS commands into relevant NETCONF-XML or RESTCONF/JSON request messages.</p> <p>For more information, see the Programmability Configuration Guide.</p>
Fast Teardown for a Mesh Access Point	<p>This feature detects the root access point uplink failure and addresses the fast teardown of a mesh network when an uplink failure occurs.</p> <p>The following commands are introduced:</p> <ul style="list-style-type: none"> • fast-teardown • wireless profile mesh <p>Note Fast Teardown for Mesh APs is not supported on Cisco Industrial Wireless (IW) 3702 Access Points.</p> <p>For more information, see the chapter Mesh Access Points.</p>
gNOI Factory Reset Services	<p>The gNOI factory reset service provides an interface that instructs target devices to clean the existing state, and start the devices in the same condition they were shipped from the factory.</p> <p>For more information, see the Programmability Configuration Guide.</p>
Installing the Cisco Catalyst 9800-CL Cloud Wireless Controller in Microsoft Azure Cloud Service	<p>Microsoft Azure Cloud Service provides users with the capability to launch the controller in the cloud infrastructure.</p> <p>For more information, see the Cisco Catalyst 9800-CL Cloud Wireless Controller Installation Guide.</p>
Managing Rogue Devices	<p>From Cisco IOS XE Cupertino 17.7.1 onwards, you can use the following signatures to identify if an AP impersonator is using a channel number that is different from the one used by the managed AP.</p> <ul style="list-style-type: none"> • Beacon DS Attack • Beacon Wrong Channel <p>For more information, see the chapter Managing Rogue Devices.</p>

Feature Name	Description and Documentation Link
Mesh Serial Backhaul	<p>The Mesh Serial Backhaul feature is supported in the controller from Cisco IOS XE Cupertino 17.7.1 onwards, for Cisco Catalyst 9124AXE Series outdoor Access Points. A new knob is introduced under the radio profile, and that radio profile is associated to a RF tag to enable the Mesh Serial Backhaul feature.</p> <p>The following commands are introduced:</p> <ul style="list-style-type: none"> • mesh backhaul • mesh designated downlink • show ap name config slot 2 inc Mesh <p>For more information, see the chapter Mesh Access Points.</p>
Real-Time Access Points Statistics	<p>From Cisco IOS XE Cupertino 17.7.1 onwards, for radio monitoring, you can reset the radios based on the statistics sent by the corresponding AP for a sampling period. When you configure the radios in the controller, if there is no increment in the Tx or Rx statistics when the radio is up, the radio reset is triggered.</p> <p>The following commands are introduced:</p> <ul style="list-style-type: none"> • show wireless stats ap join summary • show wireless stats ap history <p>For more information, see the chapter Real-Time Access Points Statistics.</p>
Remote LAN Support in Cisco Catalyst 9124AXE Access Points	<p>From Cisco IOS XE Cupertino 17.7.1 onwards, remote LAN is supported in Cisco Catalyst 9124AXE Access Points, in local mode and dual-radio mode.</p> <p>For more information, see the chapter Remote LANs.</p>
RLAN Support for Fabric	<p>From Cisco IOS XE Cupertino 17.7.1 onwards, the RLAN feature is supported on fabric.</p> <p>For more information, see the chapter Remote LANs.</p>
Smart Licensing Using Policy: Account Information Included in the ACK and show command outputs	<p>A RUM acknowledgement (ACK) includes the Smart Account and Virtual Account that was reported to, in CSSM. You can then display account information using various show commands. The account information that is displayed is always as per the latest available ACK on the product instance.</p> <p>For more information, see the chapter Smart Licensing Using Policy.</p>
Smart Licensing Using Policy: CSLU Support for Linux	<p>CSLU can now be deployed on a machine (laptop or desktop) running Linux.</p> <p>For more information, see the chapter Smart Licensing Using Policy.</p>

Feature Name	Description and Documentation Link
Smart Licensing Using Policy: Factory-installed Trust Code	<p>For new hardware orders, a trust code is now installed at the time of manufacturing. Note: You cannot use a factory-installed trust code to communicate with CSSM.</p> <p>For more information, see the chapter Smart Licensing Using Policy.</p>
Smart Licensing Using Policy: Resource Utilization Measurement (RUM) Reporting and Acknowledgment (ACK) Requirement for Cisco Catalyst 9800-CL Wireless Controller	<p>If you are using a <i>Cisco Catalyst 9800-CL Wireless Controller</i>, you must complete 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 CSSM.</p> <p>The following command is introduced:</p> <ul style="list-style-type: none"> • show license air entities <p>For more information, see the chapter Smart Licensing Using Policy.</p>
Smart Licensing Using Policy: RUM Report Optimization and Availability of Statistics	<p>RUM report generation and related processes have been optimized. This includes a reduction in the time it takes to process RUM reports, better memory and disk space utilization, and visibility into the RUM reports on the product instance (how many there are, the processing state each one is in, if there are errors in any of them, and so on).</p> <p>For more information, see the chapter Smart Licensing Using Policy.</p>
Smart Licensing Using Policy: Support for Trust Code in Additional Topologies	<p>A trust code is automatically obtained in topologies where the product instance initiates the sending of data to <i>CSLU</i> and in topologies where the product instance is in an air-gapped network.</p> <p>For more information, see the chapter Smart Licensing Using Policy.</p>
Smart Licensing Using Policy: Support to Collect Software Version Through Smart License Agent	<p>If version privacy is disabled (no license smart privacy version global configuration command), the Cisco IOS-XE software version running on the product instance and Smart Agent version information is <i>included</i> in the RUM report.</p> <p>For more information, see the chapter Smart Licensing Using Policy.</p>

Feature Name	Description and Documentation Link
Software-Defined Application Visibility and Control	<p>Software-Defined Application Visibility and Control (SD-AVC) is a network-level AVC controller that aggregates application data from multiple devices and sources, and provides composite application information.</p> <p>The following commands are introduced:</p> <ul style="list-style-type: none"> • address • avc sd-service • controller • destination-ports • dscp • segment • source-interface • transport application-updates • vrf • show sdavc ap download status • show sdavc status ap <p>For more information, see the chapter Software-Defined Application Visibility and Control.</p>
Streaming Telemetry	<p>From Cisco IOS XE Cupertino 17.7.1 onwards, on-change telemetry support is provided to a subset of XPath's.</p> <p>The following commands are introduced:</p> <ul style="list-style-type: none"> • show ap name dot11 neighbor summary • show wireless stats ap join summary sort • show ap summary sort name <p>For more information, see the chapter Streaming Telemetry.</p>
SUDI99 Certificate Support	<p>Some of the certificates used in the controller and AP platforms are expiring in May 2029 and require migration to a new set of certificates. SUDI99 certificate support addresses this migration scenario.</p> <p>The following commands are introduced:</p> <ul style="list-style-type: none"> • no platform sudi cmca3 • show platform sudi pki <p>For more information, see the chapter SUDI99 Certificate Support.</p>

Feature Name	Description and Documentation Link
Support for Federal Information Processing Standard (FIPS) Mode in Mesh Access Points	From this release onwards, FIPS mode is supported in Mesh Access Points.
Wi-Fi Protected Access 3 Hash-to-Element (H2E) Support for SAE Authentication	<p>The Hash-to-Element (H2E) is a new method for password element generation which is used in the SAE protocol. It is a computationally efficient technique to mitigate side-channel attacks.</p> <p>The following are the supported password element methods in the WLAN configuration:</p> <ul style="list-style-type: none"> • h2e: Hash-to-Element only; disables HnP. • hnp: Hunting and Pecking only; disables H2E. • Both-h2e-hnp: Both Hash-to-Element and Hunting and Pecking support is the default option. <p>The following command is modified:</p> <ul style="list-style-type: none"> • security wpa akm sae pwe {h2e hnp both-h2e-hnp} <p>For more information, see the chapter Wi-Fi Protected Access 3.</p>
Wi-Fi Protected Access 3 Support for Transition Disable	<p>Transition Disable is an indication from an AP to an STA. This feature disables a few transition modes for subsequent connections to the AP's network.</p> <p>The following command is introduced:</p> <ul style="list-style-type: none"> • transition-disable <p>For more information, see the chapter Wi-Fi Protected Access 3.</p>
YANG Model Version 1.1	<p>Cisco IOS XE Cupertino 17.7.1 uses YANG Version 1.0. However, you can download YANG Version 1.1 from the GitHub folder. For inquiries related to the <code>migrate_yang_version.py</code> script or the Cisco IOS XE YANG migration process, send an email to xe-yang-migration@cisco.com.</p> <p>For more information, see the Programmability Configuration Guide.</p>
ZTP Configuration through YANG	<p>Zero Touch Provisioning is enabled through YANG models when NETCONF is enabled.</p> <p>For more information, see the Programmability Configuration Guide.</p>

Table 2: New and Modified GUI Features

Feature Name	GUI Path
6-GHz Client Steering Support in Cisco Catalyst 9136I Access Points	• Configuration > Tags and Profiles > WLANs
6-GHz Radio Band Support in Cisco Catalyst 9136I Access Points	• Configuration > Tags & Profiles > RF/Radio > RF
Fast Teardown for a Mesh Access Point	• Configuration > Wireless > Mesh > Profiles
Mesh Serial Backhaul	• Configuration > Tags & Profiles > RF/Radio
Network Access Server Identifier	• Configuration > Security > Wireless AAA Policy
Real-Time Access Points Statistics	• Configuration > Tags & Profiles > AP Join
SUDI99 Certificate Support	• Configuration > Security > PKI Management > Trustpoint
Wi-Fi Protected Access 3 Hash-to-Element (H2E) Support for SAE Authentication	• Configuration > Tags & Profiles > WLANs

MIBs

The following MIBs are newly added or modified:

- AIRESPACE-WIRELESS-MIB.my
- CISCO-LWAPP-AP-MIB.my
- CISCO-LWAPP-AP-RADIOSTUCK-MIB.my
- CISCO-LWAPP-REAP-MIB.my
- CISCO-LWAPP-RRM-MIB.my
- CISCO-LWAPP-RF-MIB.my

Behavior Change

- Console access over serial ports is allowed only when the console activity is low. We recommend that you use a console over a Telnet session.
- If 802.11w is enabled in local mode, the controller rejects the reassociation request and sends the security association query only if the previous authentication is successful.

- Cisco TrustSec (CTS) manual and 802.1x configurations can co-exist when Security Association Protocol (SAP) is not configured.
- Downgrade to Cisco IOS XE Bengaluru 17.6.1 is not allowed on a HA system (GRUB3 instances) when smart licensing or license level is configured. Therefore, smart licensing or license data will not be retained as smart licensing with HA does not work in Cisco IOS XE Bengaluru 17.6. We recommend that you use the 17.6.2 versions to retain the license Truststore and license level configurations across HA systems.
- From this release, predownload of the AP image is based on the AP model rather than the image type. Predownload is allowed only when the model exists in the new capability XML file. Also, with appropriate modification of the capability XML, the controller can override the existing AP image for a particular model.

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.

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.
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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

Controller Model	Description
C9800-80-K9	<p data-bbox="706 289 1388 352">Eight 1/10-Gigabit Ethernet SFP or SFP+ ports and two power supply slots.</p> <p data-bbox="706 373 1079 405">The following SFPs are supported:</p> <ul data-bbox="738 420 933 756" style="list-style-type: none"><li data-bbox="738 420 885 451">• GLC-BX-D<li data-bbox="738 472 885 504">• GLC-BX-U<li data-bbox="738 525 925 556">• GLC-EX-SMD<li data-bbox="738 577 925 609">• GLC-LH-SMD<li data-bbox="738 630 933 661">• GLC-SX-MMD<li data-bbox="738 682 925 714">• GLC-ZX-SMD<li data-bbox="738 735 852 766">• GLC-TE

Controller Model	Description
	<p>The following enhanced SFPs are supported:</p> <ul style="list-style-type: none"> • SFP-10G-AOC1M • SFP-10G-AOC2M • SFP-10G-AOC3M • SFP-10G-AOC5M • SFP-10G-AOC7M • SFP-10G-AOC10M • 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-CU1M • SFP-H10GB-CU1.5M • SFP-H10GB-CU2M • SFP-H10GB-CU2.5M • SFP-H10GB-CU3M • SFP-H10GB-CU5M • SFP-H10GB-ACU7M • SFP-H10GB-ACU10M • DWDM-SFP10G-30.33 • DWDM-SFP10G-61.41

Controller Model	Description
	<p>The following QSFP+s are supported:</p> <ul style="list-style-type: none"> • 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
C9800-40-K9	<p>Four 1/10-Gigabit Ethernet SFP or SFP+ ports and two power supply slots.</p> <p>The following SFPs are supported:</p> <ul style="list-style-type: none"> • GLC-BX-D • GLC-BX-U • GLC-LH-SMD • GLC-SX-MMD • GLC-EX-SMD • GLC-ZX-SMD • GLC-TE

Controller Model	Description
	<p>The following enhanced SFPs are supported:</p> <ul style="list-style-type: none"> • SFP-10G-AOC1M • SFP-10G-AOC2M • SFP-10G-AOC3M • SFP-10G-AOC5M • SFP-10G-AOC7M • SFP-10G-AOC10M • 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-CU1M • SFP-H10GB-CU1.5M • SFP-H10GB-CU2M • SFP-H10GB-CU2.5M • SFP-H10GB-CU3M • SFP-H10GB-CU5M • SFP-H10GB-ACU7M • SFP-H10GB-ACU10M • DWDM-SFP10G-30.33 - DWDM-SFP10G-61.41

Controller Model	Description
C9800-L-C-K9	<ul style="list-style-type: none"> • 4x2.5/2-Gigabit ports • 2x10/5/2.5/1-Gigabit ports <p>The following SFPs are supported:</p> <ul style="list-style-type: none"> • GLC-BX-D • GLC-BX-U • GLC-LH-SMD • GLC-SX-MMD • GLC-ZX-SMD • GLC-TE • GLC-T
C9800-L-F-K9	<ul style="list-style-type: none"> • 4x2.5/2-Gigabit ports • 2x10/1-Gigabit ports <p>The following SFPs are supported:</p> <ul style="list-style-type: none"> • GLC-BX-D • GLC-BX-U • GLC-SX-MMD • GLC-ZX-SMD • GLC-TE • SFP-10G-LR • SFP-10G-LR-S • SFP-10G-LRM • SFP-10G-LR-X • SFP-10G-SR • SFP-10G-SR-S • SFP-10G-SR-X

The following table lists the supported SFP models.

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

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 6: Compatibility Information

Cisco Catalyst 9800 Series Wireless Controller Software	Cisco Identity Services Engine	Cisco Prime Infrastructure	Cisco AireOS-IRCM Interoperability	Cisco DNA Center	Cisco DNA Spaces - Connector	Cisco DNA Spaces - On Premise	
Cupertino 17.7.x	3.0	3.10 MR1	8.10.171.0	See Cisco DNA Center Compatibility Information	2.3.1	10.6.3	
	2.7	3.10	8.10.162.0		2.3		
	2.6	3.9	8.10.151.0		2.2		
	2.4				8.10.142.0		
					8.10.130.0		
					8.8.130.0		
					8.5.176.2		
					8.5.182.104		
					8.5.152.103		
		8.5.164.216					

GUI System Requirements

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

Table 7: Hardware Requirements

Processor Speed	DRAM	Number of Colors	Resolution	Font Size
233 MHz minimum ¹	512 MB ²	256	1280 x 800 or higher	Small

¹ We recommend 1 GHz.

² 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:

APs running Cisco IOS-XE 17.9.3 might encounter issues when attempting to upgrade their software due to insufficient space in the /tmp directory. When the /tmp space on the AP becomes full, it prevents the download of the new AP image. In such instances, we recommend that you reboot the AP.

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>.



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.
- Rolling AP upgrade, which is a part of the ISSU feature, is not supported for mesh APs.

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

- 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 DNA 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 DNA Centre.
 - 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.
- 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.

Upgrade Path to Cisco IOS XE Cupertino 17.7.x

Table 8: Upgrade Path to Cisco IOS XE Cupertino 17.7.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 17.7.x.
16.11.x	—	Upgrade first to 16.12.5 or 17.3.x and then to 17.7.x.
16.12.x	Upgrade first to 17.3.4c or later and then to 17.7.x.	You can upgrade directly to 17.7.x.
17.1.x	Upgrade first to 17.3.4c or later and then to 17.7.x.	Upgrade first to 17.3.x and then to 17.7.x.
17.2.x	Upgrade first to 17.3.4c or later and then to 17.7.x.	Upgrade first to 17.3.x and then to 17.7.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 17.7.x.	You can upgrade directly to 17.7.x.
17.3.4c or later	You can upgrade directly to 17.7.x.	You can upgrade directly to 17.7.x.
17.4.x	Upgrade first to 17.6.x and then to 17.7.x.	Upgrade first to 17.6.x and then to 17.7.x.
17.5.x	Upgrade first to 17.6.x and then to 17.7.x.	Upgrade first to 17.6.x and then to 17.7.x.
17.6.x	You can upgrade directly to 17.7.x.	You can upgrade directly to 17.7.x.

Upgrade Path to Cisco IOS XE Cupertino 17.7.x

Table 9: Upgrade Path to Cisco IOS XE Cupertino 17.7.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 17.7.x.
16.11.x	—	Upgrade first to 16.12.5 or 17.3.x and then to 17.7.x.
16.12.x	Upgrade first to 17.3.4c or later and then to 17.7.x.	Upgrade directly to 17.7.x.
17.1.x	Upgrade first to 17.3.4c or later and then to 17.7.x.	Upgrade first to 17.3.x and then to 17.7.x.
17.2.x	Upgrade first to 17.3.4c or later and then to 17.7.x.	Upgrade first to 17.3.x and then to 17.7.x.
17.3.1 to 17.3.4	Upgrade first to 17.3.4c or later and then to 17.7.x.	Upgrade directly to 17.7.x.
17.3.4c or later	Upgrade directly to 17.7.x.	Upgrade directly to 17.7.x.
17.4.x	Upgrade first to 17.6.x and then to 17.7.x.	Upgrade first to 17.6.x and then to 17.7.x.
17.5.x	Upgrade first to 17.6.x and then to 17.7.x.	Upgrade first to 17.6.x and then to 17.7.x.
17.6.x	Upgrade first to 17.3.5 and then to 17.7.x.	Upgrade directly to 17.7.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 17.7.x
- **Image Names (9800-80, 9800-40, and 9800-L):**
 - C9800-80-universalk9_wlc.17.07.01.SPA.bin
 - C9800-40-universalk9_wlc.17.07.01.SPA.bin
 - C9800-L-universalk9_wlc.17.07.01.SPA.bin
- **Image Names (9800-CL):**
 - **Cloud:** C9800-CL-universalk9.17.07.01.SPA.bin
 - **Hyper-V/ESXi/KVM:** C9800-CL-universalk9.17.07.01.iso, C9800-CL-universalk9.17.07.01.ova
 - **KVM:** C9800-CL-universalk9.17.07.01.qcow2
 - **NFVIS:** C9800-CL-universalk9.17.07.01.tar.gz

Software Installation Commands

Cisco IOS XE, Cupertino, 17.7.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 <i>filename</i> [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: <i>filename</i>	Copies the install file package from a remote location to a device, and performs a compatibility check for the platform and image versions.
activate auto-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](#).



Note Starting from Cisco IOS XE Cupertino 17.7.1, the Cisco Catalyst 9800-CL Wireless Controller will not accept more than 50 APs if the smart licensing is not connected and up.

For a more detailed overview on Cisco Licensing, see [cisco.com/go/licensingguide](https://www.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 10: Test Configuration for Interoperability

Hardware or Software Parameter	Hardware or Software Type
Release	Cisco IOS XE, Cupertino, 17.7.x
Cisco Wireless Controller	See Supported Hardware .
Access Points	See Supported APs .
Radio	<ul style="list-style-type: none"> • 802.11ax • 802.11ac • 802.11a • 802.11g • 802.11n
Security	Open, PSK (WPA2-AES), 802.1X (WPA2-AES) (EAP-FAST, EAP-TLS) 802.11ax
RADIUS	See Compatibility Matrix, on page 19
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 11: 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
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

Client Type and Name	Driver or Software Version
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
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

Client Type and Name	Driver or Software Version
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
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

Client Type and Name	Driver or Software Version
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 Xperia 1 ii	Android 11
Sony Xperia	Android 11
Xiaomi Mi 9T	Android 9
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

Client Type and Name	Driver or Software Version
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 6.4
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
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, 17.7.1

Caveat ID	Description
CSCvz89115	Flexconnect APs are not forwarding DHCP packets after change-of-authorization (CoA) with a change of VLAN using 802.1x encryption.
CSCvz94692	AP crash is observed due to radio failure (too many radio failures).
CSCwa01168	Controller reloads unexpectedly due to mobilityd crash.
CSCwa12278	Cisco Catalyst 9115 AP is crashing due to kernel panic.
CSCwa13091	Radio Resource Management (RRM): Tx power changes are not getting applied to the AP.
CSCwa14307	AP crash is observed due to kernel panic.
CSCvz82490	Suite B: Incorrect APUT response to STA using incorrect TLS authentication parameters test.
CSCwa23783	IOS-XE based RLAN capable AP's are unable to join AireOS or Cisco Catalyst 9800 controllers.

Resolved Caveats for Cisco IOS XE, Cupertino, 17.7.1

Caveat ID	Description
CSCvv94885	The show ap cdp neighbours command displays the name of the switch instead of the domain name.

Caveat ID	Description
CSCvx71141	Cisco Catalyst 9800-80 Wireless Controller crashes due to a CPU hog in the radio resource management (RRM) process.
CSCvx78215	An IOS XE device might crash at DoubleExceptionVector.
CSCvx81815	Controller does not send server hello packets to AP when enabling Datagram Transport Layer Security (DTLS) encryption.
CSCvy01360	Cisco Catalyst 9115AX AP is reporting false radar detection on channels 100-112.
CSCvy02120	Cisco Catalyst 9130AX AP fails to send reassociation response to roaming clients and deletes the client.
CSCvy05019	The output of the show platform software system all command output does not display interfaces greater than 10.
CSCvy11011	Controller displays a traceback similar to: EVENTLIB-3-CPUHOG - ewlc_client_location - remove_weakest_radio_measurement.
CSCvy11394	Controller allows configuring netflow on L2 port-channel.
CSCvy11981	Controller reloads unexpectedly when AP name is more than 31 characters.
CSCvy14956	Controller sends DHCP as relay proxy even when the client SVI interface is shutdown.
CSCvy25684	Different data rates are observed in CLI and RF profiles.
CSCvy36744	Controller stops forwarding broadcasts intermittently to clients.
CSCvy46043	Controller reloads unexpectedly for switch integrated security features (SISF) heap pointer to l2_socket_counter record.
CSCvy58934	Controller is not sending the CAPWAP restart payload when filter is applied and AP name is changed.
CSCvy72750	Unable to use the wireless broadcast vlan command.
CSCvy73836	Cisco Catalyst 9800-80 Controller goes to ROMMON after multiple failovers due to power cycling.
CSCvy74904	AP authorization related RADIUS request does not include the calling station ID and NAS port type.
CSCvy76922	Switch stack with Cisco IOS XE 17.3.2a displays high memory alerts.
CSCvy87749	Controller sends DHCP as relay proxy even after removing IP helper from the client SVI interface.
CSCvy89423	WNCMGRD process has crashed due to segmentation fault.

Caveat ID	Description
CSCvy89508	The primary member displays "standby hot" even though the standby is in recovery mode.
CSCvy90646	Controller drops the incoming CAPWAP keepalive for random APs.
CSCvy94284	Controller crashes after running clear wlan id command.
CSCvy99116	A crash is observed when a wireless client attempts to connect and the connection times out.
CSCvz11154	Continuous memory leak with multiple table entries is observed in FMAN database.
CSCvz14394	Custom-page in web authentication parameter map is not loaded into running configuration after a reload.
CSCvz15015	Cisco Catalyst 9130AX AP loses its WLAN configuration after moving between controllers.
CSCvz17623	Memory leak is observed in emulated database and AP join.
CSCvz28378	Memory leak is observed in WNCD process running 17.3.3 of around 200MB per day.
CSCvz39749	Client location probe displays error when probe request parsing fails.
CSCvz45305	Controller is missing fields in the access-request when sending it for a sleeping client.
CSCvz45488	Memory leak is observed in the OPERATIONAL_DB causing dbm crash.
CSCvz45576	Rogue telemetry updates need to be throttled as the controller sends lot of rogue reports to Cisco DNAC.
CSCvz51976	Include AP ethernet speed and duplex information in the output of show ap config general command.
CSCvz52851	SSO switchover does not re-establish LISP sessions to the CPs.
CSCvz53408	Fast Transition IE is sent as 0 in M3 after session timeout.
CSCvz63742	Controller does not provide cLApAdminStatus information through SNMP when forensic Advanced Wireless Intrusion Prevention System (aWIPS) is configured.
CSCvz68857	Optimize bsnMobileData OID query to improve performance.
CSCvz77768	Cisco IOS AP brings the radio down after encountering Dynamic Frequency Selection (DFS) event even when non-DFS channels are available.

Caveat ID	Description
CSCvz80697	Controller does not remove old NMSP entries when new probes are received in a different slot.
CSCvz84691	Controller crashes due to WNCD process when learning an IP address for a client.
CSCvz89976	Controller running 17.3.4 crashes due to workgroup bridge (WGB).

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](#)

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 Prime Infrastructure

[Cisco Prime Infrastructure Documentation](#)

Cisco Connected Mobile Experiences

[Cisco Connected Mobile Experiences Documentation](#)

Cisco DNA Center

[Cisco DNA Center Documentation](#)

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