

Cisco Catalyst 9800-40 Wireless Controller Hardware Installation Guide

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Preface

This preface describes this guide and provides information about the conventions used in this guide, along with details about related documentation. It includes the following sections:

- Document Revision History, on page vii
- Document Objectives, on page vii
- Audience, on page vii
- Conventions, on page viii
- Related Documentation, on page ix
- Obtaining Documentation and Submitting a Service Request, on page ix

Document Revision History

The following table shows the changes made to this document:

Date	Change Summary
April 2024	Fist version of the document

Document Objectives

This publication describes the installation of the Cisco Catalyst 9800-40 Wireless Controller.

Audience

This publication is primarily designed for persons responsible for installing, maintaining, and troubleshooting the Cisco Catalyst 9800-40 Wireless Controller. The users of this guide should:

- Be familiar with electronic circuitry and wiring practices.
- Have experience working as electronic or electromechanical technicians.
- Have experience in installing high-end networking equipment.

Note Some procedures described in this guide require a certified electrician.

Conventions

Text Type	Indication
User input	Text the user should enter exactly as shown or keys a user should press appear in this font.
Document titles	Document titles appear in *this font*.
System output	Terminal sessions and information that the system displays appear in **this font**.
CLI commands	CLI command keywords appear in **this font** . Variables in a CLI command appear in *this font* .
[ ]	Elements in square brackets are optional.
{x | y | z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
String	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
! #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

Tip Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

Caution Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

Timesaver: Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS. Statement 1071



Related Documentation

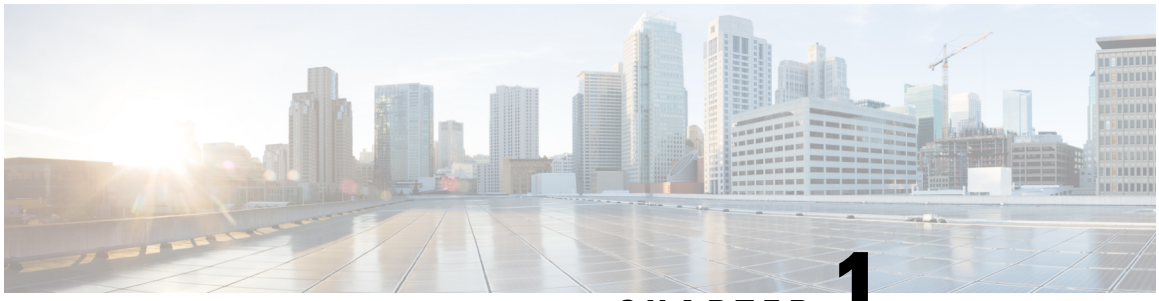
See the following documentation for more information about the Cisco Catalyst 9800 Wireless ControllerCisco Catalyst 9800-40 Wireless Controller:

- Release Notes for Cisco Catalyst 9800 Wireless Controller *Cisco Catalyst 9800-40 Wireless Controller*
- Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide
- Cisco Catalyst 9800 Series Wireless Controller Command Reference
- Cisco Wireless Solutions Software Compatibility Matrix

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation.

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the What's New in Cisco Product Documentation RSS feed. RSS feeds are a free service.



CHAPTER 1

Overview

Note This product is identified for end of life. Read the full end-of-life announcement.

Customers are encouraged to migrate to the new Cisco CW9800M Wireless Controllers. These new controllers are both only 1RU and have improved power consumption efficiency and run on the same IOS XE software as the C9800-40. For more information, see:

- Cisco CW9800M Wireless Controller Data Sheet
- Cisco CW9800M Wireless Controller Hardware Installation Guide

The Cisco Catalyst 9800-40 Wireless Controller is a 40-G wireless controller that occupies one rack unit space and populates four ports. The Cisco Catalyst 9800-40 Wireless Controller portfolio comes with a modular Crypto Coprocessor that aggregates services at scale.

The Cisco Catalyst 9800-40 Wireless Controller offers a compact form factor that consumes less rack space and power while offering 40 Gbps forwarding throughput.

- Summary of Cisco Catalyst 9800-40 Wireless Controller, on page 1
- Cisco Product Identification Standard, on page 8
- Serial Number and PID/VID Label Location, on page 9

Summary of Cisco Catalyst 9800-40 Wireless Controller

The Cisco Catalyst 9800-40 Wireless Controller supports:

- Up to 32 GB of DDR3 error-correcting code-protected field-replaceable memory, with single-bit error correction and multi-bit error detection.
- A fixed forwarding processor with up to 40 Gbps sustained forwarding data traffic through the chassis.
- Up to 30 Gbps security and crypto processing through a dedicated security processor.
- RJ-45 console ports and a mini USB console port.
- 32 GB internal bootflash storage.
- One copper Ethernet 10/100/1000 Mbps network management port.

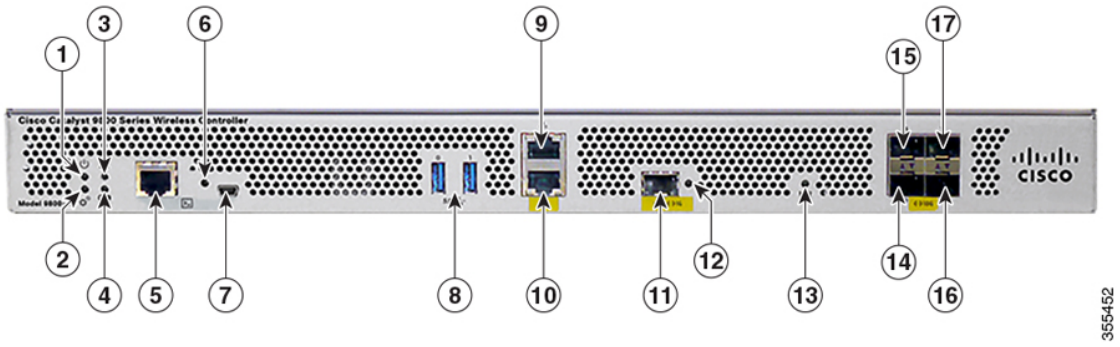
- An embedded USB (eUSB) flash module that supports 32 GB of nonvolatile Flash storage.
- Two USB 3.0 ports that are backward compatible with USB 2.0.
- SATA hard disk.
- Four built-in 10 GE SFP+ ports (capable of SyncE and MACsec).
- Stratum 3E network clocking per GR-1244-CORE, using 10 GE, or 1 GE interfaces as timing sources
- LED indicators for Ethernet and console status, as well as visual system state indications.
- Command-line interface (CLI), alarm, network management, logging, statistics aggregation, and on-board failure logging (OBFL).
- Environmental chassis management.
- 80 Mb ternary content-addressable memory (TCAM).
- Field-replaceable units (FRU).

  See Chapter 2, **Supported Hardware Components** for information on supported FRUs.

Front View

The following figure shows the front of the Cisco Catalyst 9800-40 Wireless Controller.

Figure 1: Cisco Catalyst 9800-40 Wireless Controller Front View



1	PWR—Power LED	11	RP—1-GE SFP port
2	SYS—System LED	12	LINK—RJ-45 connector LED
3	ALM—Alarm LED	13	SSD—SSD activity LED
4	HA—High-Availability LED	14	TE0—1-GE SFP/ 10-GE SFP+ Port 0
5	RJ-45 compatible console port	15	TE1—1-GE SFP/ 10-GE SFP+ Port 1
6	EN—USB console-enabled LED	16	TE2—1-GE SFP/ 10-GE SFP+ Port 2
7	Mini USB console port	17	TE3—1-GE SFP/ 10-GE SFP+ Port 3

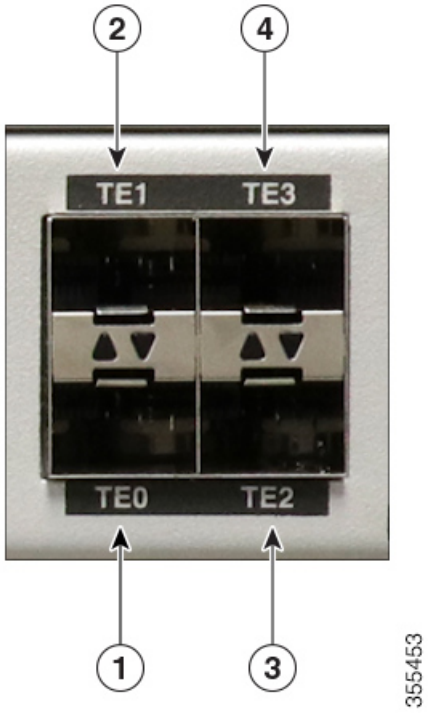
8	USB ports 0 and 1		
9	SP—RJ-45 10/100/1000 management Ethernet port		
10	RP—RJ-45 10/100/1000 redundancy Ethernet port		

Note For the Cisco Catalyst 9800-40 Wireless Controller, the power supplies (PEM 0 and PEM1), are located in the rear of the chassis. See the **Rear View** section.

Built-In SFP and SFP+ Ports

The following figure shows the port numbering for the built-in ports.

Figure 2: Cisco Catalyst 9800-40 Wireless Controller Port Numbering



1	TE0—10GE SFP+ transceiver
2	TE1—10GE SFP+ transceiver
3	TE2—10GE SFP+ transceiver
4	TE3—10GE SFP+ transceiver

Note By default, the interfaces from 0 - 3 in the Cisco Catalyst 9800-40 Wireless Controller are enabled.

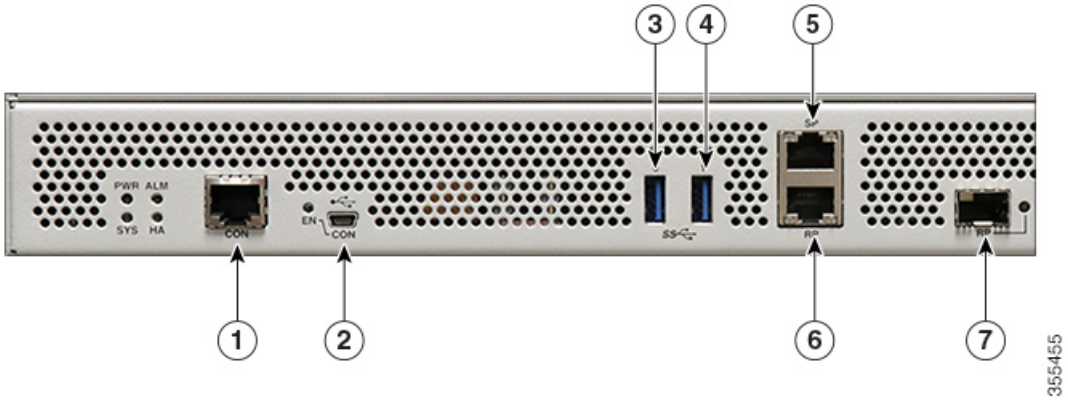
The port LEDs behave as follows:

- Off—Indicates the port is not enabled by software.
- Amber—Indicates the port is enabled by software but there is a problem with the link.
- Green—Indicates the port is enabled by software and there is valid link.

Management and Storage Connections

The following figure shows the management and storage connections for the Cisco Catalyst 9800-40 Wireless Controller:

Figure 3: Management and Storage Connections for the Cisco Catalyst 9800-40 Wireless Controller



1	CON—RJ-45 compatible console port	5	SP—RJ-45 10/100/1000 management Ethernet port
2	CON—Mini USB connector console port	6	RP—RJ-45 10/100/1000 redundancy Ethernet port
3	USB port 0	7	RP—1-GE SFP+ port
4	USB port 1		

LEDs

The following figure shows the LEDs on the front panel of the Cisco Catalyst 9800-40 Wireless Controller:

Figure 4: Cisco Catalyst 9800-40 Wireless Controller LEDs



No.	LED Label	Description	LED Color	Behavior
1	PWR	Power	Green	If all the power rails are based on the specification.
2	SYS	System	On	Remains ON during IOS boot complete.
			Blinking Green	Remains blinking when IOS booting is in progress.
			Amber	Remains ON during system crash.
			Blinking Amber	Remains blinking during secure boot failure.
			Off	Remains OFF during ROMMON boot.

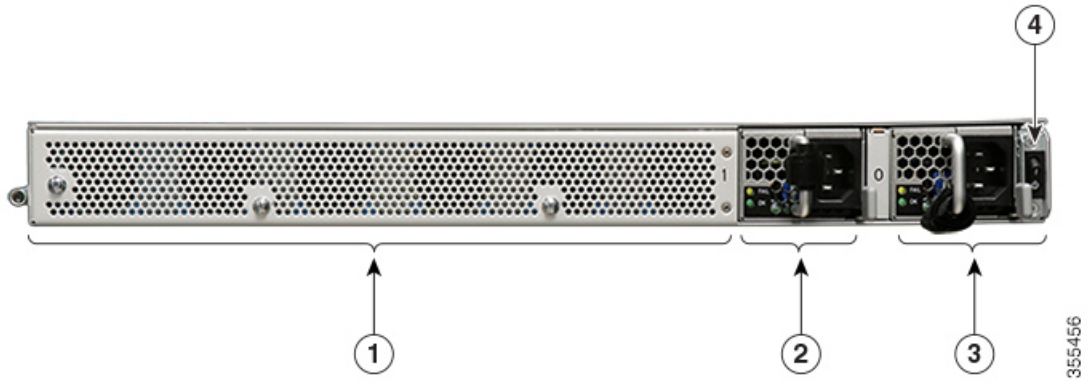
No.	LED Label	Description	LED Color	Behavior
3	ALM	Alarm	Green 	Remains ON during ROMMON boot complete.
			Blinking Green 	Remains blinking when system upgrade is in progress.
			Amber 	Remains ON during ROMMON and SYSTEM boot ups.
			Blinking Amber 	Remains blinking during temperature error and secure boot failure.
			Red	Indicates that the system detects critical warnings. **Note** The **show facility-alarm status** command denotes system alarms.
			Off	Remains OFF during IOS boot. Normal Operation
4	HA	High Availability	Green 	Remains ON when HA is active.
			Blinking Green 	Remains blinking when HA Standby Hot.
			Amber 	Blinks slowly when booted or HA Standby Cold.
			Blinks Fast 	Blinks fast during HA maintenance.
5	EN	USB console enabled	Green 	Indicates that the mini USB connector is used as the console.

No.	LED Label	Description	LED Color	Behavior
6	LINK	Management	Solid Green	Indicates that the RJ-45 connector is not used as the console.
			Flash Green	Indicates that the RJ-45 connector is being used as the console.
		Built-in EPA (1 SFP + Port Status of 4 LEDs with 1 per SFP)	Off	No link.
		Built-in EPA (1 SFP + Port Status of 4 LEDs with 1 per SFP)	Off	Indicates that the port is not enabled.
			Amber	Port enabled with a problem in the Ethernet link.
			Green	Port enabled with a valid Ethernet link.
7	SSD	SSD Activity	Green	Remains ON during the SSD activity.

Rear View

The following figure shows the rear of the Cisco Catalyst 9800-40 Wireless Controller:

Figure 5: Cisco Catalyst 9800-40 Wireless Controller Rear View



1	Fans	3	Power supply (PEM 0)
2	Power supply (PEM 1)	4	Power/standby switch

The chassis has a front-to-rear airflow. Six internal fans draw cooling air into the chassis and across internal components to maintain an acceptable operating temperature. The fans are numbered from 0 to 5, right to left.

Two power supplies (AC) are accessed from the rear of the controller and are hot-swappable.

Caution The Cisco Catalyst 9800-40 Wireless Controller can support two AC power supplies.

Cisco Product Identification Standard

This section describes the Cisco products and services product identification standard. This feature provides you with the ability to effectively integrate and manage Cisco products in your network and business operations.

Unique Device Identifier

The Unique Device Identifier (UDI) is the Cisco product identification standard for hardware products. A product identification standard removes barriers to enterprise automation and can help you reduce operating expenses.

The UDI provides a consistent electronic, physical, and associated business-to-business information product identification standard.

The UDI is a combination of five data elements. The following table lists the UDI elements:

Table 1: UDI Elements

UDI Data Element	Electronic Visibility	Physical Visibility	Description
PID	Yes	Yes	Product ID, also known as product name, model name, product number
VID	Yes	Yes	Version ID
SN	Yes	Yes	Serial number, the unique instance of the PID
Entity Name	Yes	—	Type, such as chassis, slot, or power supply
Product Description	Yes	—	Additional product information

The combination of serial number and product ID (PID) is unique and consistent across all Cisco products. The PID that is coded on hardware is called a base product identifier.

Additional orderable PIDs can be associated to a base PID. For instance, an orderable PID may describe a packaging configuration for a product or a bundled group of products sold, tested, and shipped together. Specific unique device identifier (UDI) benefits include the following:

- Identifies:

- Individual Cisco products in your networks
- PIDs and serial numbers for service and replaceable products
- Version IDs (VIDs) for product version visibility

- Facilitates discovery of products subject to recall or upgrade
- Enhances inventory automation of Cisco products

The Cisco product identification standard provides the following features:

show diag chassis eeprom Command

The **show diag chassis eeprom** command displays the PID, VID, PCB serial number, hardware revision, and other such information.

The following is sample output from the show diag chassis eeprom command:

```
WLC# show diag chassis eeprom
MIDPLANE EEPROM data:
Product Identifier (PID) : C9800-40-K9
Version Identifier (VID) : V01
PCB Serial Number : xxxxxxxxxx Top Assy. Part Number : xx-xxxx-xx Hardware Revision : 0.1
Asset ID :
CLEI Code : XXXXXXXXXX
```

Note Common Language Equipment Identification (CLEI) code is a ten-digit character code that identifies a specific product. A CLEI code is applied to each part within a Cisco Catalyst 9800-40 Wireless Controlleras they are programmed in manufacturing for shipment to customers.

show license udi Command

The **show license udi** command displays UDI information.

The following is sample output from the **show license udi** command:

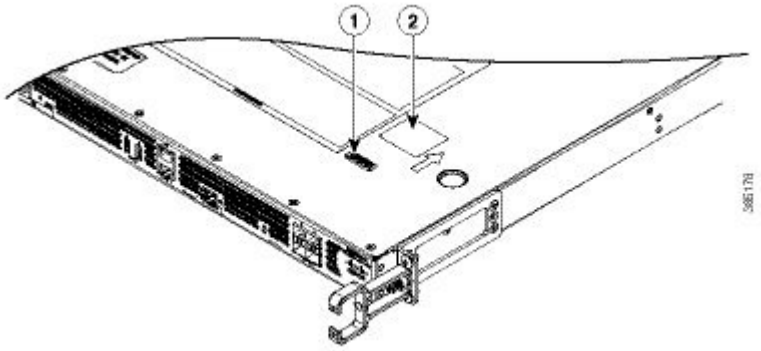
```
WLC# show license udi
SlotID        PID                 SN                            UDI
-------------------------------------------------------------------------------
*            C9800-40-K9       xxxxxxxxxx                C9800-40-K9:xxxxxxxxxx
```

Note For complete information on the product identification standard, see https://www.cisco.com/c/en/us/products/unique-device-identifier-udi.html.

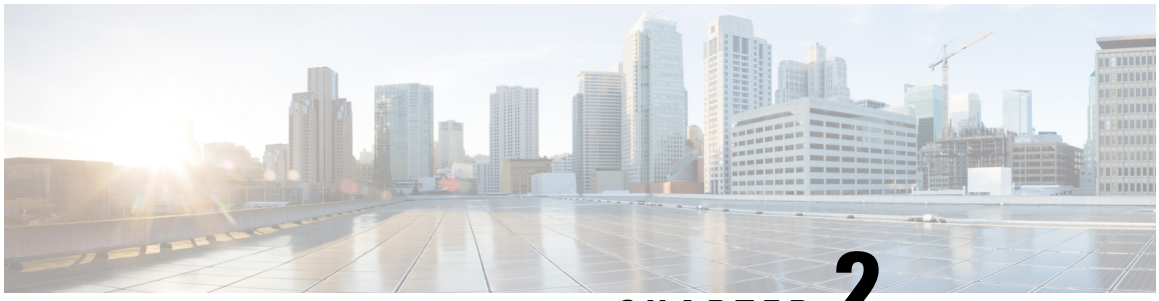
Serial Number and PID/VID Label Location

The following figures show the location of the serial number and the PID/VID label on the Cisco Catalyst 9800-40 Wireless Controller:

Figure 6: Cisco Catalyst 9800-40 Wireless Controller Serial Number and PID/VID Label Location



1	Serial Number	2	PID/VID Label



CHAPTER 2

Supported Hardware Components

This chapter contains information about the supported hardware components on the Cisco Catalyst 9800-40 Wireless Controller.

- Supported Transceivers, on page 11
- Power Supplies, on page 11

Supported Transceivers

The Cisco Catalyst 9800-40 Wireless Controller supports the following small form-factor pluggable (SFP) and CPAK optical transceiver types:

Table 2: Supported SFP+ Transceiver

PID	Description
SFP-10G-SR	10GBASE-xx SFP
SFP-10G-LR	
SFP-10G-ER	
SFP-10G-ZR	

For more information about the supported SFP+ transceivers, see the datasheet at 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

Power Supplies

The Cisco Catalyst 9800-40 Wireless Controller supports AC power supply. The modular chassis configurations support the installation of two power supplies for redundancy. When an external power supply fails or is removed, the other power supply provides power requirements for the chassis. This allows you to hot-swap the power supply without impacting the functionality of the controller.

Note A Cisco Catalyst 9800-40 Wireless Controller can support two AC power supplies.

The power supplies are used in a 1 + 1 redundant configuration. There is no input switch on the faceplate of the power supplies. A power supply is switched from Standby to On by way of a system chassis power switch.

The following table lists the power supplies that you can order:

Part Number	Power Supply
C9800-AC-750W-R	Cisco Catalyst 9800-40 Wireless Controller power supply module with plug-side intake airflow, AC, 750W

Note Platform related information can be obtained through a programmable interface using openconfig-platform model. However, power auditing per component is not supported.

Caution The chassis has a front-to-rear airflow. All the power supplies and fan modules in the chassis must use the same airflow direction or an error will occur with possible overheating and shut down of the controller. If you power up the controller with more than one airflow direction, you must power down the controller and replace the modules with the wrong airflow direction before powering up the controller.

Power Supply LEDs

The following table describes the power supply LEDs:

Table 3: AC Power Supply LEDs

Power Supply Condition	Green (OK) LED Status	Amber (FAIL) LED Status
No AC power to all power supplies	OFF	OFF
Power Supply Failure (includes over voltage, over current, over temperature and fan failure)	OFF	ON
Power Supply Warning events where the power supply continues to operate (high temperature, high power and slow fan)	OFF	1Hz Blinking
AC Present/3.3VSB on (PSU OFF)	1Hz Blinking	OFF
Power Supply ON and OK	ON	OFF

Power Supply Fans

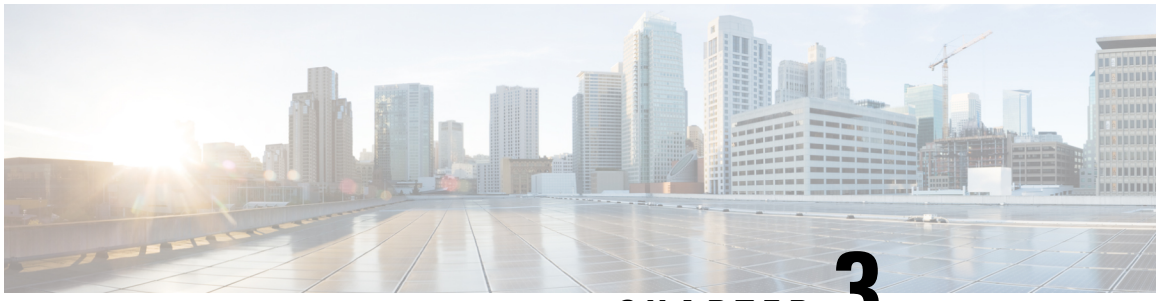
The fans in the power supply module are used for cooling the power supply module itself while a system-level cooling is provided by fans within the chassis. The power supplies do not depend on the system-level fans for cooling. Fan-rotation sensors determine the fan failures

Note The fans in the Cisco Catalyst 9800-40 Wireless Controller power supplies have plug-side exhaust airflow.

Caution The chassis has a front-to-rear airflow. All power supplies and fan modules in the same chassis must use the same airflow direction or an error will occur with possible overheating and shut down of the controller.

If you power up the controller with more than one airflow direction, you must power down the controller and replace the modules with the wrong airflow direction before powering up the controller.

Note The fans in the power supply modules run when the power supply is plugged in, even if the power switch is in the standby position.



CHAPTER 3

Preparing Your Site for Installation

This chapter contains important safety information you should know before working with the Cisco Catalyst 9800-40 Wireless Controller, and guides you through the process of preparing your site for wireless controller installation.

- Prerequisites and Preparation, on page 15
- Safety Guidelines, on page 16
- Standard Warning Statements, on page 17
- Site Planning, on page 20
- Site Cabling Guidelines, on page 23
- Rack-Mounting Guidelines, on page 25
- Preventing Electrostatic Discharge Damage, on page 28
- Electrical Safety, on page 29
- Chassis-Lifting Guidelines, on page 29
- Tools and Equipment, on page 29
- Unpacking and Verifying Shipping Contents, on page 30
- Installation Checklist, on page 31

Prerequisites and Preparation

Before you perform the procedures in this guide, we recommend that you:

- Read the safety guidelines in the next section and review the electrical safety and ESD-prevention guidelines in this guide.
- Ensure that you have all of the necessary tools and equipment (see the **Tools and Equipment** section).
- Ensure that you have access to the *Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide* (an online document that is available for viewing or download at Cisco.com) during the installation.
- Ensure that the power and cabling requirements are in place at your installation site.
- Ensure that the equipment required to install the controller is available.
- Ensure that your installation site meets the environmental conditions to maintain normal operation.

Before installing the controller, you must consider power and cabling requirements that must be in place at your installation site, special equipment for installing the controller, and the environmental conditions your installation site must meet to maintain normal operation.

The shipping package for the controller is engineered to reduce the chances of product damage associated with routine material handling experienced during shipment:

- Controller should always be transported or stored in its shipping package in the upright position.
- Keep the controller in the shipping container until you have determined the installation site.

Note Inspect all items for shipping damage. If an item appears damaged, contact a Cisco customer service representative immediately

Site Planning Checklist

Use the following checklist to perform and account for all the site-planning tasks described in this chapter:

- The site air conditioning system can compensate for the heat dissipation of the controller.
- Electrical service to the site complies with the requirements.
- The electrical circuit servicing the controller complies with the requirements.
- Consideration has been given to console port wiring and limitations of the cabling involved, according to TIA/EIA-232F.
- The Ethernet cabling distances are within limitations.
- The equipment rack in which you plan to install the controller chassis complies with requirements. Careful consideration has been given for safety, ease of maintenance, and proper airflow in selecting the location of the rack.

Safety Guidelines

Before you begin the installation or replacement procedure, review the safety guidelines in this section to avoid injuring yourself or damaging the equipment.

Note This section contains guidelines, and do not include every potentially hazardous situation. When you install a controller, always use common sense and caution.

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, might harm you. A warning symbol precedes each warning statement.

Before you install, configure, or perform maintenance on the controller, review the documentation for the procedure you are about to perform, paying special attention to the safety warnings.

Note Do not unpack the system until you are ready to install it. Keep the chassis in the shipping container to prevent accidental damage until you determine an installation site. Use the appropriate unpacking documentation included with the system.

Read the installation instructions in this document before you connect the system to its power source. Failure to read and follow these guidelines could lead to an unsuccessful installation and possibly damage the system and components.

Safety Recommendations

The following guidelines will help to ensure your own safety and protect your Cisco equipment. This list does not cover all potentially hazardous situations, so *be alert*.

- Review the safety warnings listed in *Regulatory Compliance and Safety Information - Cisco Catalyst 9800-40 Wireless Controller* (available online at Cisco.com) before installing, configuring, or maintaining the controller.
- Always unplug the power cable before installing or removing a chassis.
- Keep the chassis area clear and dust free during and after installation.
- The controller operates safely when it is used in accordance with its marked electrical ratings and product-usage instructions.

Standard Warning Statements

Note The English warnings in this document are preceded by a statement number. To see the translations of a warning in other languages, look up its statement number in the *Regulatory Compliance and Safety Information - Cisco Catalyst 9800-40 Wireless Controller* .

This section describes the warning definition and then lists core safety warnings grouped by topic.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS. Statement 1071

General Safety Warnings



Warning **Read the installation instructions before using, installing or connecting the system to the power source.**

Statement 1004



Warning **Class 1 Laser.**

Statement 1008



Warning **Pluggable optical modules comply with IEC 60825-1 Ed. 3 and 21 CFR 1040.10 and 1040.11 with or without exception for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019.**

Statement 1255



Warning **Ultimate disposal of this product should be handled according to all national laws and regulations.**

Statement 1040



Warning **No user-serviceable parts inside. Do not open.**

Statement 1073



Warning **Installation of the equipment must comply with local and national electrical codes.**

Statement 1074

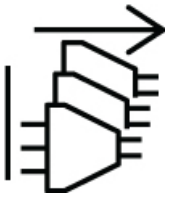


Warning **Only trained and qualified personnel should be allowed to install, replace, or service this equipment.**

Statement 1030

Warning **This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.**

Statement 1028



Warning **This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.**

Statement 1017

Warning **Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard.**

Statement 1056

Fiber type and Core diameter (μm)	Wavelength (nm)	Max. Power (mW)	Beam Divergence (rad)
SM 11	1200-1400	39-50	0.1-0.11
MM 62.5	1200-1400	150	0.18 NA
MM 50	1200-1400	135	0.17 NA
SM 11	1200-1600	112-145	0.11-0.13

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place**

Statement 1029

Site Planning

This section contains site-planning information, and will help you plan for the installation of the controller.

General Precautions

Observe the following general precautions when using and working with the controller:

- Keep your system components away from radiators and heat sources and do not block cooling vents.
- Do not spill food or liquids on your system components and never operate the product in a wet environment.
- Do not push any objects into the openings of your system components. Doing so can cause fire or electric shock by shorting out interior components.
- Position system cables and power supply cable carefully. Route system cables and power supply cable and plug such that they cannot be stepped on or tripped over. Be sure that nothing else rests on your system component cables or power cable.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications. Always follow your local and national wiring rules.
- If you turn off your system, wait at least 30 seconds before turning it on again to avoid system component damage.

Site Selection Guidelines

The Cisco Catalyst 9800-40 Wireless Controller requires specific environmental operating conditions. Temperature, humidity, altitude, and vibration can affect the performance and reliability of the controller. The following sections provide specific information to help you plan for a proper operating environment.

The Cisco Catalyst 9800-40 Wireless Controller are designed to meet the industry EMC, safety, and environmental standards described in the *Regulatory Compliance and Safety Information - Cisco Catalyst 9800-40 Wireless Controller* document.

Site Environmental Requirements

Environmental monitoring protects the system and components from damage caused by excessive voltage and temperature conditions. To ensure normal operation and avoid unnecessary maintenance, plan and prepare your site configuration before installation. After installation, make sure the site maintains the environmental characteristics, as shown in the following table.

Table 4: Cisco Catalyst 9800-40 Wireless Controller Environmental Tolerance

Environmental Characteristic	Minimum	Maximum
Operating temperature (nominal)	32° F (0° C)	104° F (40° C) (40° C up to 10,000 feet)
Operating temperature (short term)	32° F (0° C)	122° F (50° C)

Environmental Characteristic	Minimum	Maximum
Storage temperature	–4° F (–20° C)	158° F (70° C)
Operative humidity (nominal) (relative humidity)	10%	90%
Operative humidity (short term)	5%	90%
Storage humidity (relative humidity)	5%	95%
Altitude, operating: over allowable temperature range (0° to 50° C)	–500 feet (–152.4 meters)	6,000 feet (1829 meters)
Altitude, nonoperating: over allowable temperature range	–1000 feet (–304.8 meters)	50,000 feet (15240 meters)
Thermal shock nonoperating with change over time of 3 minutes	–13° F (–25° C)	158° F (70° C)
Thermal Shock - Operating at 2.5° C per minute	32° F (0° C)	122° F (50° C)

Physical Characteristics

Be familiar with the physical characteristics of the Cisco Catalyst 9800-40 Wireless Controller to assist you in placing the system at a proper location.

Note For information regarding rack widths supported for the controller, see the following sections:

- **General Rack-Selection Guidelines**
- **Guidelines for 23-in. (Telco) Racks**

The following table shows the weight and dimensions of the Cisco Catalyst 9800-40 Wireless Controller:

Table 5: Physical Characteristics of the Cisco Catalyst 9800-40 Wireless Controller

Characteristic	Cisco Catalyst 9800-40 Wireless Controller
Height	1.72 in. (43.69 mm)—1RU; rack-mount per EIA RS-310
Width	17.3 in. (439.42 mm)
Depth	21.78 in. (553.2 mm) Depth includes card handles, cable-management brackets, and power-supply handles
Weight	23 lb (10.43 kg) fully loaded

The following list describes additional characteristics:

- Chassis height meets EIA-310 rack spacing, universal rack mount
  - Cisco Catalyst 9800-40 Wireless Controller—1RU (1.75 in. or 44.45 mm)
- Chassis width meets EIA-310 19 in. (17.3 in. or 439.42 mm) wide with rack brackets
- Cable-management brackets allow a bend radius of 1.5 in. (38.1 mm) for cables
- Ships with forward rack-mount brackets installed and an extra set included in the accessory kit

Site Power Guidelines

The Cisco Catalyst 9800-40 Wireless Controller has specific power and electrical wiring requirements. Adhering to these requirements ensures reliable operation of the system. Follow these precautions and recommendations when planning your site for the controller:

- The redundant power option provides a second, identical power supply to ensure that power to the chassis continues uninterrupted if one power supply fails or input power on one line fails.
- In systems configured with the redundant power option, connect each of the two power supplies to a separate input power source. If you fail to do this, your system might be susceptible to total power failure due to a fault in the external wiring or a tripped circuit breaker.
- To prevent a loss of input power, be sure the total maximum load on each circuit supplying the power supplies is within the current ratings of the wiring and breakers.
- Check the power at your site before installation, and periodically after installation, to ensure that you are receiving clean power. Install a power conditioner if necessary.
- Provide proper grounding to avoid personal injury and damage to the equipment due to lightning striking power lines or due to power surges. The chassis ground must be attached to a central office or other interior ground system.

Electrical Circuit Requirements

The Cisco Catalyst 9800-40 Wireless Controller requires a dedicated electrical circuit. If you equip it with dual-power feeds, you must provide a separate circuit for each power supply to avoid compromising the power redundancy feature.

The Cisco Catalyst 9800-40 Wireless Controller can only be powered by an AC source. Ensure that equipment grounding is present and observe power-strip ratings. Make sure that the total ampere rating of all the products plugged into the power strip does not exceed 80 percent of the rating.

AC Power Supplies



Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than:**

AC: 20A U.S. maximum

Statement 1005

The following table lists the power supply system rating requirements for the Cisco Catalyst 9800-40 Wireless Controller .

Table 6: AC Power Supply System Rating Specifications for the Cisco Catalyst 9800-40 Wireless Controller

Description	Specification
Power supply declared ratings	AC = 100-240 VAC
Line frequency rating	50/60 Hz for AC power supplies

Site Cabling Guidelines

This section contains guidelines for wiring and cabling at your site. When preparing your site for network connections to the Cisco Catalyst 9800-40 Wireless Controller, consider the type of cable required for each component, and the cable limitations. Consider the distance limitations for signaling, EMI, and connector compatibility. Possible cable types are fiber, thick or thin coaxial, foil twisted-pair cabling, or unshielded twisted-pair cabling.

Also consider any additional interface equipment you need, such as transceivers, hubs, switches, modems, channel service units (CSUs), or data service units (DSUs).

Before you install the controller, have all the additional external equipment and cables at hand. For ordering information, contact a Cisco customer service representative.

The extent of your network and the distances between network interface connections depend in part on the following factors:

- Signal type
- Signal speed
- Transmission medium

The distance and rate limits referenced in the following sections are the IEEE-recommended maximum speeds and distances for signaling purposes. Use this information as guidelines when planning your network connections prior to installing the Cisco Catalyst 9800-40 Wireless Controller.

If wires exceed recommended distances, or if wires pass between buildings, give special consideration to the effect of a lightning strike in your vicinity. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic devices. If you have had problems of this sort in the past, you may want to consult experts in electrical surge suppression and shielding.



Note If you are using a copper cable to connect the Redundancy Ports (RPs) back-to-back, the maximum length of the cable can be 30 meters. If you want to use a longer cable, you will need to switchover to fiber optic cables.

Console Port Connections

The Cisco Catalyst 9800-40 Wireless Controller provides console ports to connect a terminal or computer for local console access.

Both ports have RJ-45 connectors, support RS-232 asynchronous data, and have distance recommendations specified in the IEEE RS-232 standard.

USB Serial Console

The USB serial console port connects directly to the USB connector of a PC using a USB Type A to 5-pin mini USB Type-B cable. The USB Console supports full speed (12Mbps) operation. The console port does not support hardware flow control.

Note

- Always use shielded USB cables with a properly terminated shield. The USB serial console interface cable must not exceed 3 meters in length.
- Only one console port can be active at a time. When a cable is plugged into the USB console port, the RJ-45 port becomes inactive. Conversely, when the USB cable is removed from the USB port, the RJ-45 port becomes active.
- 4-pin mini USB Type-B connectors are easily confused with 5-pin mini USB Type-B connectors. Only 5-pin mini USB Type-B is supported.

Interference Considerations

When wires are run for a significant distance, there is a risk that stray signals will be induced on the wires as interference. If interference signals are strong, they can cause data errors or damage to the equipment.

The following sections describe sources of interference and how to minimize its effects on Cisco Catalyst 9800-40 Wireless Controller .

Electromagnetic Interference

All the equipment powered by AC current can propagate electrical energy that can cause electromagnetic interference (EMI) and possibly affect the operation of other equipment. The typical sources of EMI are equipment power cords and power service cables from electric utility companies.

Strong EMI can destroy the signal drivers and receivers in the controller and even create an electrical hazard by causing power surges through power lines into installed equipment. These problems are rare, but could be catastrophic.

To resolve these problems, you need specialized knowledge and equipment, which could consume substantial time and money. However, you should ensure that you have a properly grounded and shielded electrical environment, paying special attention to the need for electrical surge suppression.

The following table lists electrode magnetic compliance standards for the controller.

Table 7: EMC and Safety Standards

EMC Standards	FCC 47 CFR Part 15 Class A VCCI Class A AS/NSZ Class A ICES-003 Class A EN55022/CISPR 22 Information Technology Equipment (Emissions) EN55024/CISPR 24 Information Technology Equipment (Immunity) EN300 386 Telecommunications Network Equipment (EMC) EN50082-1/EN61000-6-1 Generic Immunity Standard
Safety Standards	UL60950-1 CSA C22.2 No. 60950-1 EN 60825-1:2014 EN 60950-1 IEC 60825-1:2014 IEC 60950-1 AS/NZS 60950.1

Radio Frequency Interference

When electromagnetic fields act over a long distance, radio frequency interference (RFI) can be propagated. Building wiring can often act as an antenna, receiving the RFI signals and creating more EMI on the wiring.

If you use twisted-pair cable in your plant wiring with a good distribution of grounding conductors, the plant wiring is unlikely to emit radio interference. If you exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal.

Lightning and AC Power Fault Interference

As this product is safety certified for indoor connection only, if signal wires exceed recommended cabling distances, you should consider the effect that a lightning strike in your vicinity might have on the controller.

The electromagnetic pulse (EMP) generated by lightning or other high-energy phenomena can couple enough energy into unshielded conductors to damage or destroy electronic equipment. If you have previously experienced such problems, you should consult with RFI/EMI experts to ensure that you have adequate electrical surge suppression and shielding of signal cables in your controller operating environment.

Rack-Mounting Guidelines

This section describes guidelines on rack-mounting.

Precautions for Rack-Mounting

The following rack-mounting guidelines are provided to ensure your safety:

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable.**

The following guidelines are provided to ensure your safety:

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.**

Statement 1006

- Do not move large racks by yourself. Due to the height and weight of a rack, a minimum of two people are required to accomplish this task.
- Ensure that the rack is level and stable before extending a component from the rack.
- Ensure that proper airflow is provided to the components in the rack.
- Do not step or stand on any component or system when servicing other systems or components in a rack.

General Rack-Selection Guidelines

The Cisco Catalyst 9800-40 Wireless Controller can be mounted in most two-post or four-post, 19-in. equipment racks that comply with the Electronics Industries Association (EIA) standard for equipment racks (EIA-310-D 19-in.). The rack must have at least two posts with mounting flanges to mount the chassis.

Warning **To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 104°F (40°C).**

Statement 1047

The distance between the center lines of the mounting holes on the two mounting posts must be 18.31 in. ± 0.06 in. (46.50 cm ± 0.15 cm). The rack-mounting hardware included with the chassis is suitable for most 19-in. (48.3-cm) equipment racks.

Consider installing the Cisco Catalyst 9800-40 Wireless Controller in a rack with the following features:

- EIA or ETSI hole patterns in the mounting rails. Required mounting hardware is shipped with the controller. If the rack that you plan to install the system in has metric-threaded rails, you must provide your own metric-mounting hardware.
- Perforated top and open bottom for ventilation to prevent overheating.
- Leveling feet for stability.

Note The controller must not be installed in an enclosed rack because the chassis requires an unobstructed flow of cooling air to maintain acceptable operating temperatures for its internal components. Installing the controller in any type of enclosed rack—even with the front and back doors removed—could disrupt the air flow, trap heat next to the chassis, and cause an over temperature condition inside the controller. If you use an enclosed rack, make certain that there are air vents on all sides of the rack and there is proper ventilation.

Guidelines for 23-in. (Telco) Racks

If needed, you can also install the Cisco Catalyst 9800-40 Wireless Controller in 23-in. (Telco) racks. For information on the adapters needed for 23 in. racks, contact the Newton Instrument Company:

```
http://www.enewton.com
111 East A Street, Butner NC, USA, 27509
919 575-6426
```

Equipment Rack Guidelines

The placement of racks can affect personnel safety, system maintenance, and the system's ability to operate within the environmental characteristics described in **Table: Cisco Catalyst 9800-40 Wireless Controller Environmental Tolerance**. Choose a proper location for the controller by following the guidelines below.

Locating for Safety

If the Cisco Catalyst 9800-40 Wireless Controller is the heaviest or the only piece of equipment in the rack, consider installing it at or near the bottom to ensure that the rack's center of gravity is as low as possible.

Locating for Easy Maintenance

Keep at least 3 feet of clear space in front of and behind the rack. This space ensures that you can remove the Cisco Catalyst 9800-40 Wireless Controller components and perform routine maintenance and upgrades easily.

Avoid installing the controller in a congested rack and consider how the routing of cables from other pieces of equipment in the same rack might affect access to the controller's cards.

The front and top of the chassis must remain unobstructed to ensure adequate airflow and prevent overheating inside the chassis.

Allow the following clearances for normal system maintenance:

- At the top of the chassis—At least 3 in. (7.6 cm)
- In front of the chassis—3 to 4 ft (91.44 cm to 121.92 cm)

To avoid problems during installation and ongoing operation, follow these general precautions when you plan the equipment locations and connections:

- Use the **show environment all** and the **show facility-alarm status** commands regularly to check the internal system status. The environmental monitor continually checks the interior chassis environment; it provides warnings for high temperature and creates reports on any occurrences. If warning messages are displayed, take immediate action to identify the cause and correct the problem. For more information on these commands, see the **Environmental Monitoring and Reporting Functions** section.
- Keep the Cisco Catalyst 9800-40 Wireless Controller off the floor and out of the areas that collect dust.

- Follow ESD-prevention procedures to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.

Locating for Proper Airflow

Ensure that the location of the Cisco Catalyst 9800-40 Wireless Controller has enough airflow to keep the system operating within the environmental characteristics, and the air temperature is sufficient to compensate for the heat dissipated by the system.

Avoid locating the Cisco Catalyst 9800-40 Wireless Controller in a location in which the chassis air intake vents could draw in the exhaust air from adjacent equipment. Consider how the air flows through the controller. The airflow direction is front to back with ambient air drawn in from the venting located on the chassis' front sides.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage occurs when electronic cards or components are improperly handled resulting in complete or intermittent failures. Static electricity can harm delicate components inside your system. To prevent static damage, discharge static electricity from your body before you touch any of your system components, such as a microprocessor. As you continue to work on your system, periodically touch an unpainted metal surface on the computer chassis.

The following are guidelines for preventing ESD damage:

- Always use an ESD-preventive wrist or ankle strap and ensure that it makes good skin contact. Before removing a card from the chassis, connect the equipment end of the strap to the ESD plug at the bottom of the chassis below the power entry modules.
- Handle line cards by faceplates and carrier edges only; avoid touching the card components or connector pins.
- When removing a module, place the removed module component-side-up on an antistatic surface or in a static-shielding bag. If the module is to be returned to the factory, immediately place it in a static-shielding bag.
- Avoid contact between the modules and clothing. The wrist strap protects the card from ESD voltages only on the body; ESD voltages on clothing can still cause damage.
- When transporting a sensitive component, place it in an antistatic container or packaging.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.



Caution For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 ohms.



Caution Always tighten the captive installation screws on all the system components when you are installing them. These screws prevent accidental removal of the module, provide proper grounding for the system, and help ensure that the bus connectors are properly seated in the backplane.

Electrical Safety

All the system components are hot-swappable. They are designed to be removed and replaced while the system is operating, without presenting an electrical hazard or damage to the system.

Follow these basic guidelines when you are working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before installing or removing a chassis.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe. Never install equipment that appears damaged.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Chassis-Lifting Guidelines

The chassis is not intended to be moved frequently. Before you install the system, ensure that your site is properly prepared so that you can avoid having to move the chassis later to accommodate power sources and network connections.



Warning **To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.**

Statement 1032

Each time you lift the chassis or any heavy object, follow these guidelines:

- Ensure that your footing is solid, and balance the weight of the chassis between your feet.
- Lift the chassis slowly; never move suddenly or twist your body as you lift.
- Keep your back straight and lift with your legs, not your back. If you must bend down to lift the chassis, bend at the knees, not at the waist, to reduce the strain on your back muscles.
- Do not remove installed components from the chassis.
- Always disconnect all external cables before lifting or moving the chassis.

Tools and Equipment

The following tools and equipment are recommended as the minimum necessary equipment to install the Cisco Catalyst 9800-40 Wireless Controller. You may need additional tools and equipment to install associated

equipment and cables. You may also require test equipment to check electronic and optical signal levels, power levels, and communications links.

- Philips hand screwdriver
- 3.5-mm flat-blade screwdriver
- Tape measure (optional)
- Level (optional)
- Power drill
- 8-gauge wire
- Rack-mount brackets
- Cable-management brackets

Unpacking and Verifying Shipping Contents

When you receive your chassis, perform the following steps and use the shipping contents checklist in the following section.

Procedure

Step 1 Inspect the box for any shipping damage. (If there is damage, contact your Cisco service representative).

Step 2 Unpack the Cisco Catalyst 9800-40 Wireless Controller .

Step 3 Perform a visual inspection of the chassis.

Step 4 After you have unpacked the system, verify that you have received all of the required components, including all the accessory items. Using the packing list as a guide, verify that you have received all the equipment listed in your order, and ensure that the configuration matches the packing list.

Checking the Shipping Container Contents

Use the components list shown in the following table to check the contents of the Cisco Catalyst 9800-40 Wireless Controller shipping container. Do not discard the shipping container. You need the container, if you move or have to ship the controller in the future.

Table 8: Cisco Catalyst 9800-40 Wireless Controller Shipping Container Contents

Component	Description
Chassis	Cisco Catalyst 9800-40 Wireless Controller are configured with dual AC power supplies and an EPA and NIM blank panel if an EPA or NIM has not been ordered.

Component	Description
Accessories Kit **Note** You must order the Accessories Kit separately if you order the Cisco Catalyst 9800-40 Wireless Controller chassis as a spare.	Front 19-inch rack-mount brackets. **Note** Rear rack-mount brackets are not included. Rear spare PID (A1K-1RU-REAR=) contains the rear rack-mount bracket to secure the rear side of the chassis. **Note** You can order the PID as a spare only. You will need to move the ground lug to the front position to install the rear bracket.
	Three sets of screws, one each for: • Front rack-mount brackets (use the black screws) • Rear rack-mount brackets (use the package with the 5 screws) • Cable-management brackets (use the package with the 4 screws)
	Two cable-management brackets with U-feature design devices attached.
	1 RJ-45 to RJ-45 crossover cable 1 RJ-45 to DB-9 (female) adapter
ESD, Wrist Strap (disposable)	One disposable wrist strap
Documentation	Pointer Doc
Optional Equipment	Powercord if an AC power supply was shipped.

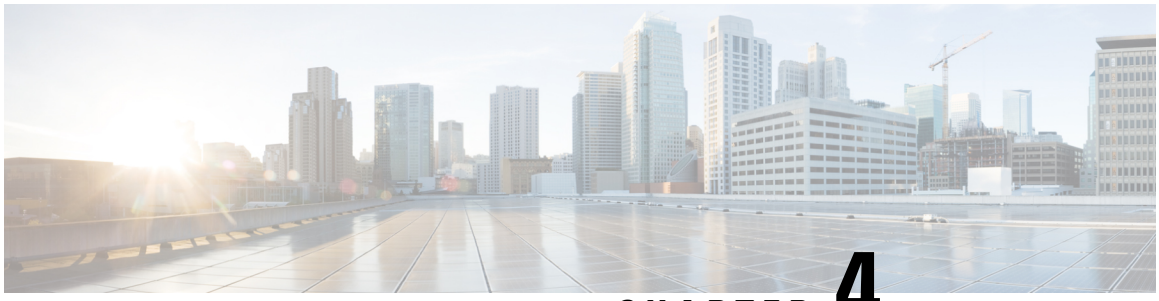
Installation Checklist

To assist you with your installation and to provide a historical record of what was done by whom, print or photocopy the installation checklist below. Use this to record when each procedure or verification is completed. When the checklist is completed, place it in your site log along with the other records for your new controller.

Table 9: Installation Checklist

Task	Verified By	Date
Date chassis received		
Chassis and all accessories unpacked		
Types and numbers of interfaces verified		

Task	Verified By	Date
Safety recommendations and guidelines reviewed		
Installation Checklist copied		
Site log established and background information entered		
Site power voltages verified		
Site environmental specifications verified		
Required passwords, IP addresses, device names, and so on, available		
Required tools available		
Network connection equipment available		
Cable-management brackets installed (optional, but recommended)		
AC power cable(s) connected to AC source(s) and controller		
Network interface cables and devices connected		
System power turned on		
System boot complete (STATUS LED is on)		
Ethernet port adapters and NIMs (where applicable) are operational		
Correct hardware configuration displayed after system banner appears		
Correct licenses installed on the controller		



CHAPTER 4

Installing the Controller

This chapter provides procedures for installing the Cisco Catalyst 9800-40 Wireless Controller on an equipment shelf, tabletop, or in an equipment rack.

- Installation Methods, on page 33
- Guidelines for a Standalone Equipment Shelf or Tabletop Installation, on page 34
- Installing the Controller on a Standalone Equipment Shelf or Tabletop, on page 34
- Guidelines for Rack Installation, on page 35
- Attaching Front Rack-Mount Brackets, on page 37
- Attaching Rear Rack-Mount Brackets, on page 38
- Mounting the Controller in the Rack, on page 39
- Attaching the Cable Management Bracket, on page 42
- Chassis Ground Connection, on page 44
- Connecting Cables, on page 47
- Management Ethernet Port Cable Connection, on page 48

Installation Methods

The Cisco Catalyst 9800-40 Wireless Controller s are designed for standalone, 2-rail 19-inch rack-mount (front rail only), and 4-rail 19-inch rack-mount (front and rear rail) installations.

Although rack-mounting is the preferred method of installation, you can mount the chassis on an equipment shelf or tabletop.

Warning **Read the installation instructions before using, installing or connecting the system to the power source.**

Statement 1004

Note Proceed with the installation, if you have already unpacked your chassis and read all the site requirements for your new equipment.

Guidelines for a Standalone Equipment Shelf or Tabletop Installation

The chassis should already be in the area where you want to install it. If you have not determined where to install your chassis, see the **Preparing Your Site for Installation** section for information about site considerations.

When installing the Cisco Catalyst 9800-40 Wireless Controller on a sturdy equipment shelf or tabletop, ensure that the surface is clean and that you have considered the following:

- The Cisco Catalyst 9800-40 Wireless Controller requires at least 3 inches (7.62 cm) of clearance at the inlet and exhaust vents (the front and rear sides of the chassis).
- The chassis should be installed off the floor. Dust that accumulates on the floor is drawn into the interior of the controller by the cooling fans. Excessive dust inside the controller can cause over temperature conditions and component failures.
- There must be approximately 19 inches (48.3 cm) of clearance at the front and rear of the chassis to install and replace FRUs, or to access network cables and equipment.
- The chassis needs adequate ventilation. Do not install it in an enclosed cabinet where ventilation is inadequate.
- Keep the cable-management bracket ready, if you plan to install it on the front of the chassis.
- Ensure that an adequate chassis ground (earth) connection exists for your controller chassis (see the **Attaching a Chassis Ground Connection** section).

Installing the Controller on a Standalone Equipment Shelf or Tabletop

Procedure

Step 1 Remove any debris and dust from the tabletop or platform, as well as the surrounding area.

Step 2 Lift the chassis into position on the equipment shelf or tabletop.

Note
Step 3 to **Step 9** are optional, if you are installing the Cisco Catalyst 9800-40 Wireless Controller on a rack shelf. The chassis rack-mount brackets must be installed prior to installing the cable-management brackets. See the **Attaching the Front Rack-Mount Brackets** section.

Step 3 Attach the front rack-mount brackets. Locate the threaded holes in the front sides of the chassis (first holes beyond the vent holes) and use the package of black screws that is shipped with the chassis.

Step 4 Align the front rack-mount bracket to one side of the chassis.

Step 5 Insert and tighten the screws on one side.

Step 6 Repeat **Step 3** to **Step 5** on the other side of the chassis. Use all the screws to secure the rack-mount brackets to the chassis.

Step 7 Gather the two cable-management brackets and screws shipped with your chassis. See the **Attaching Cable Management Bracket** section.

Step 8 Screw a cable-management bracket to each side of the rack-mount brackets that are attached to the chassis. Use two screws for each cable-management bracket. Use a screw from the package of four screws.

Note
Ensure that the cable-management U feature device has the open end pointing outwards when you attach it to the chassis.

Step 9 Check that all the screws are securely tightened.

What to do next

Go to the **Attaching a Chassis Ground Connection** section for instructions about continuing the installation.

Guidelines for Rack Installation

The can be installed in the following rack types:

- Two-post rack, either 19 inch or 23 inch. Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm). Airflow through the chassis is from front to back.
- Four-post, 19-inch equipment rack. Inner clearance (the width between the inner sides of the two posts or rails) must be at least 19 inches (48.26 cm). Airflow through the chassis is from front to back.

Note The can be installed with front rack-mount brackets.

When planning your rack installation, consider the following guidelines:

- The requires a minimum of 1.75 inches or 4.45 cm rack units of vertical rack space. Measure the proposed rack location before mounting the chassis in the rack.
- Before using a particular rack, check for obstructions (such as a power strip) that could impair the rack-mount installation. If a power strip does impair a rack-mount installation, remove the power strip before installing the chassis, and then replace it after the chassis is installed.
- Allow sufficient clearance around the rack for maintenance. If the rack is mobile, you can push it back near a wall or cabinet for normal operation and pull it out for maintenance (installing or moving cards, connecting cables, or replacing or upgrading components). Otherwise, allow 19 inches (48.3 cm) of clearance to remove field-replaceable units.
- Maintain a minimum clearance of 3 inches on the front and back sides of the chassis for the cooling air inlet and exhaust ports, respectively. Avoid placing the chassis in an overly congested rack or directly next to another equipment rack; the heated exhaust air from other equipment can enter the inlet air vents and cause an over temperature condition inside the controller.
- Always install heavier equipment in the lower half of a rack to maintain a low center of gravity to prevent the rack from falling over.

- Install and use the cable-management brackets included with the controller to keep cables organized and out of the way of cards and processors. Ensure that cables from other equipment already installed in the rack do not impair access to the cards or require you to disconnect cables unnecessarily to perform equipment maintenance or upgrades.
- Provide an adequate chassis ground (earth) connection for your controller chassis.

In addition to the preceding guidelines, review the precautions for avoiding excessive temperature conditions in the **Physical Characteristics** section and the **Site Environmental Requirements** section.

Warning **To reduce risk of electric shock and fire, take care when connecting units to the supply circuit so that wiring is not overloaded.**

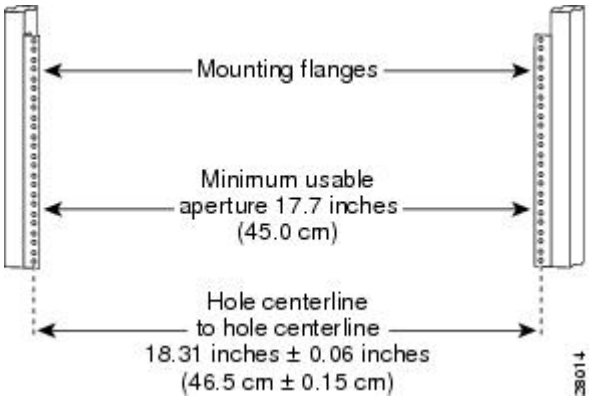
Statement 1018

Verifying Rack Dimensions

Before you begin

Before you install the chassis, measure the space between the vertical mounting flanges (rails) on your equipment rack to verify that the rack conforms to the measurements shown in the following figure.

Figure 7: Verifying Equipment Rack Dimensions



Procedure

Step 1 Mark and measure the distance between two holes on the left and right mounting rails. The distance should measure 18.31 inches ± 0.06 inches (46.5 cm ± 0.15 cm)

Note
Measure for pairs of holes near the bottom, middle, and top of the equipment rack to ensure that the rack posts are parallel.

Step 2 Measure the space between the inner edges of the left front and right front mounting flanges on the equipment rack. The space must be at least 17.7 inches (45 cm) to accommodate the chassis that is 17.25 inches (43.8 cm) wide and fits between the mounting posts on the rack.

Attaching Front Rack-Mount Brackets

Before you begin

Before installing the chassis in the rack, you must install the rack-mount brackets on each side of the chassis.

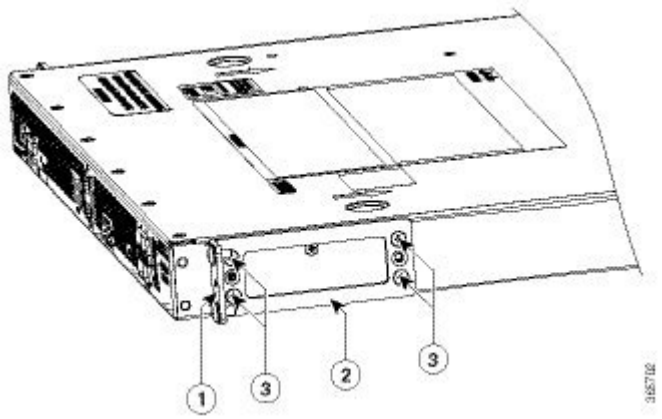
Determine where in the rack you want the chassis to be mounted. If you are mounting more than one chassis in the rack, then start from the bottom up or the center of the rack. The following figure shows the brackets attached to the chassis. Depending on the bracket holes you use, the chassis may protrude in the rack

Note The cable-management brackets are attached to the chassis after you install the chassis rack-mount brackets on the chassis and mount the chassis in the rack

Procedure

Step 1 Locate the threaded holes on the side of the chassis. Ensure that you hold the front rack-mount bracket with the ear and holes facing outward and towards the front of the chassis. The following figure shows where to attach the front rack-mount brackets to the Cisco Catalyst 9800-40 Wireless Controller.

Figure 8: Attaching the Front Rack-Mount Brackets to the Cisco Catalyst 9800-40 Wireless Controller



1	Front rack-mount bracket ear and holes	3	Front rack-mount bracket screws
2	Front rack-mount bracket		

Step 2 Position the front rack-mount bracket top hole with the chassis, first top hole behind the side vent holes.

Step 3 Insert and tighten the black screws on one side.

Step 4 Repeat **Step 1** to **Step 3** on the other side of the chassis. Use black screws to secure the rack-mount brackets to the chassis.

Attaching Rear Rack-Mount Brackets

Before you begin

Note This procedure is not required if you are installing the chassis in a two-post rack.

Before installing the chassis in a four-post rack, you must install the rear rack-mount brackets on each side of the chassis.

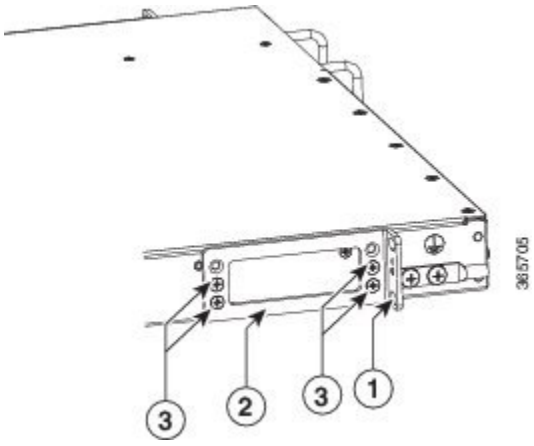
Determine where in the rack you want the chassis to be mounted. If you are mounting more than one chassis in the rack, then start from the bottom up or the center of the rack. The following figure shows the brackets attached to the chassis

Procedure

Step 1 Locate the threaded holes on the side of the chassis. Ensure that you hold the rear rack-mount bracket with the ear and holes facing outward and towards the rear of the chassis.

The following figure shows where to attach the rear rack-mount brackets to the Cisco Catalyst 9800-40 Wireless Controller.

Figure 9: Attaching the Rear Rack-Mount Brackets to the Cisco Catalyst 9800-40 Wireless Controller



1	Rear rack-mount bracket ear and holes	3	Rear rack-mount bracket screws
2	Rear rack-mount bracket		

Step 2 Position the rear rack-mount bracket with the chassis.

Step 3 Insert the black screws on one side. Do not fully tighten the screws. The rear bracket holes are slotted to allow for adjustment. Do not fully tighten the screws until the chassis is installed in the four-post rack.

Step 4 Repeat **Step 1** to **Step 3** on the other side of the chassis. Use black screws to secure the rack-mount brackets to the chassis.

Mounting the Controller in the Rack

After installing the rack-mount brackets on the chassis, mount the chassis by securing the rack-mount brackets to two posts or mounting strips in the rack using the screws provided. Because the rack-mount brackets support the weight of the entire chassis, ensure that you use all the screws to fasten the two rack-mount brackets to the rack posts.

Two-Post Rack Installation

Before you begin

The Cisco Catalyst 9800-40 Wireless Controller can be installed on a two-post rack, either 19 inch or 23 inch. We recommend that you allow at least 1 or 2 inches (2.54 or 5.08 cm) of vertical clearance between the controller and any equipment directly above and below it.

Procedure

Step 1 On the chassis, ensure that all the screw fasteners on the installed components are securely tightened.

Step 2 Make sure that your path to the rack is unobstructed. If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized

Step 3 (Optional) Install a shelf in the rack to support the Cisco Catalyst 9800-40 Wireless Controller . If you use a shelf, it helps support the chassis while you secure it to the rack.

Note
If you are using a shelf, place the chassis on the shelf and slightly raise the front of the chassis to align the mounting bracket holes with the rack post holes while allowing the bottom of the chassis to rest on the shelf.

Step 4 With two people, lift the chassis into position between the rack posts.

Step 5 Align the mounting bracket holes with the rack post holes and attach the chassis to the rack.

Step 6 Position the chassis until the rack-mounting flanges are flush against the mounting rails on the rack.

Tip
To allow space to attach the cable-management brackets to the chassis in the rack easily, use the rack-mount bracket ear holes mentioned in Steps 7 and 8.

Step 7 Hold the chassis in position against the mounting rails in the equipment rack and follow these steps:

a. Insert the bottom screw into the second hole up from the bottom of the rack-mount ear and use a hand-held screwdriver to tighten the screw to the rack rail.

Tip
To make installation easier, insert one screw at the bottom of the chassis and the next screw at the top of the chassis diagonally from the first screw

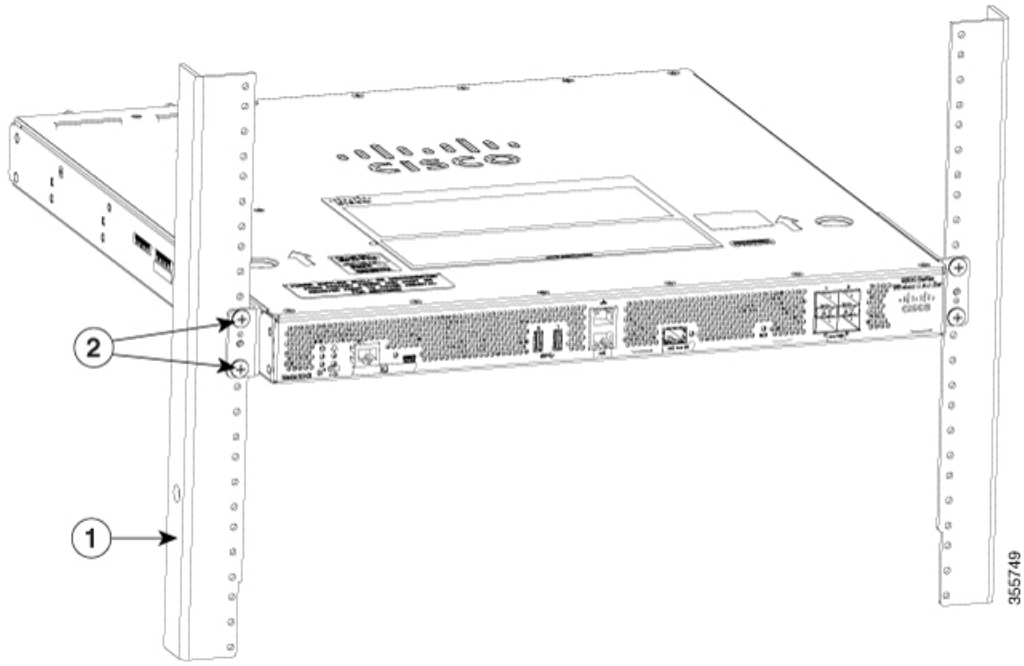
b. Insert the top screw into the second hole from the top of the rack-mount ear diagonally from the bottom screw and tighten the screw to the rack rail.

c. Insert the rest of the screws to secure the chassis to the rack equipment.

Step 8 Tighten all the screws on each side to secure the chassis to the equipment rack.

The following figure shows the Cisco Catalyst 9800-40 Wireless Controller on a two-post equipment rack.

Figure 10: Cisco Catalyst 9800-40 Wireless Controller Installed on a Two-Post Equipment Rack



1	Rack equipment rail	2	Rack mount bracket ear and screws

What to do next

This completes the procedure for installing the chassis on a two-post rack. Proceed to the **Attaching a Chassis Ground Connection** section to continue with the installation.

Four-Post Rack Installation

Procedure

Step 1 (Optional) Install a shelf in the rack to support the Cisco Catalyst 9800-40 Wireless Controller. If you use a shelf, it helps support the chassis while you secure it to the rack.

Note
If you are using a shelf, place the chassis on the shelf and slightly raise the front of the chassis to align the mounting bracket holes with the rack post holes while allowing the bottom of the chassis to rest on the shelf.

Step 2 With two people, lift the chassis into position between the rack posts.

Step 3 Position the chassis until the rack-mounting flanges are flush against the mounting rails on the rack.

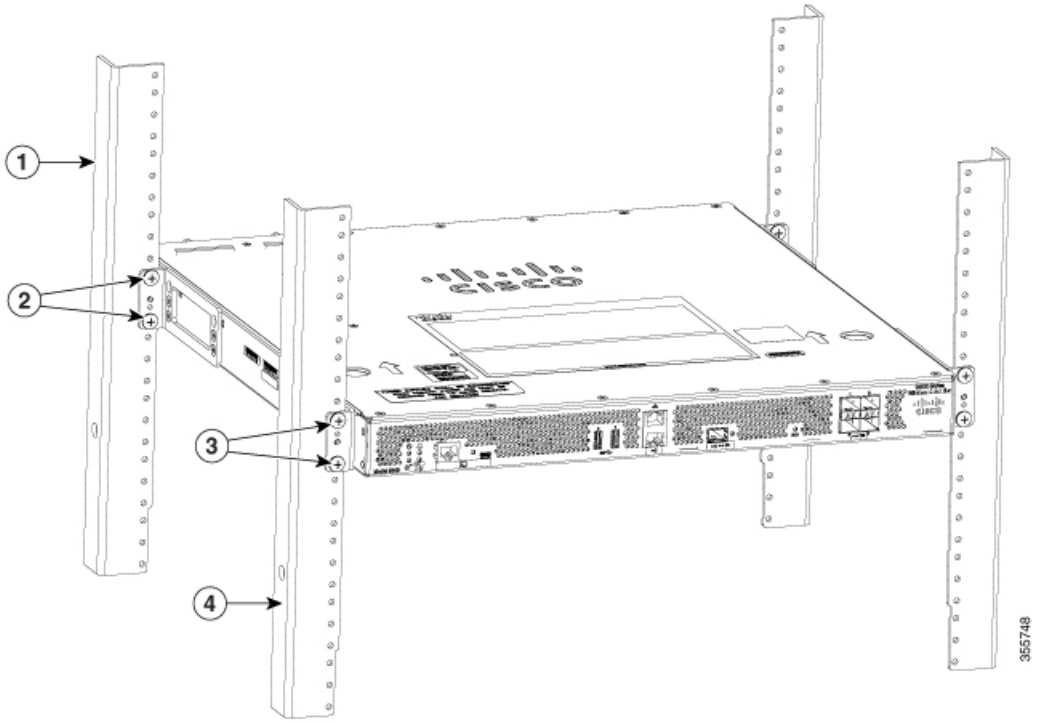
Note
Use the second hole up from the bottom of the rack-mount bracket and the second hole down from the top of the rack-mount bracket. This will make it easier to attach the cable-management bracket to the chassis in the equipment rack.

Step 4 Hold the chassis in position against the mounting rails while the second person finger-tightens a screw to the rack rails on each side of the chassis.

Step 5 Finger-tighten screws to the rack rails on each side of the chassis.

Step 6 Tighten all the screws on each side to secure the chassis to the equipment rack. The following figure shows the Cisco Catalyst 9800-40 Wireless Controller on a four-post equipment rack.

Figure 11: Cisco Catalyst 9800-40 Wireless Controller in a Four-Post Rack—Front and Rear Rack-Mounting



1	Rear rack equipment rail	3	Front rack mount bracket ear and screws
2	Rear rack mount bracket ear and screws	4	Front rack equipment rail

Step 7 Use a level to verify that the tops of the two brackets are level, or use a measuring tape to verify that both brackets are the same distance from the top of the rack rails.

What to do next

This completes the procedure for installing the chassis in the rack. Proceed to the **Attaching a Chassis Ground Connection** section to continue the installation.

Attaching the Cable Management Bracket

Before you begin

The cable management brackets should be mounted to each rack-mount bracket on the chassis to provide cable management to both sides of the chassis. These brackets are screw-mounted to the rack-mount brackets to allow easy installation and removal of cables.

The cable-management brackets for the Cisco Catalyst 9800-40 Wireless Controller contains one independent cable-management U-type feature with two screws for each bracket.

Note Make certain that the cable-management bracket "U" feature is facing upwards when you attach it to the chassis.

Procedure

Step 1 Align the cable-management bracket to the rack-mount bracket on one side of the Cisco Catalyst 9800-40 Wireless Controller.

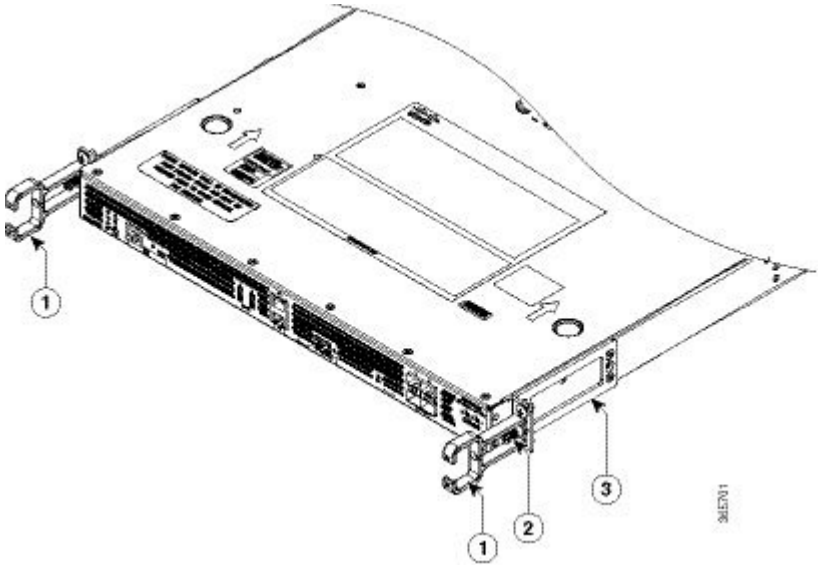
The cable-management bracket aligns to the top hole of the chassis rack-mount bracket.

Step 2 Using a Phillips screwdriver, insert one screw through the top screw hole of the cable-management bracket and into the chassis rack-mount bracket and tighten the screw

Note
Use the package of screws that came with your chassis containing four screws.

The following figure shows where to attach the cable-management brackets to the Cisco Catalyst 9800-40 Wireless Controller.

Figure 12: Attach the Cable-Management Brackets to the Attaching the Cable-Management Brackets to the Cisco Catalyst 9800-40 Wireless Controller

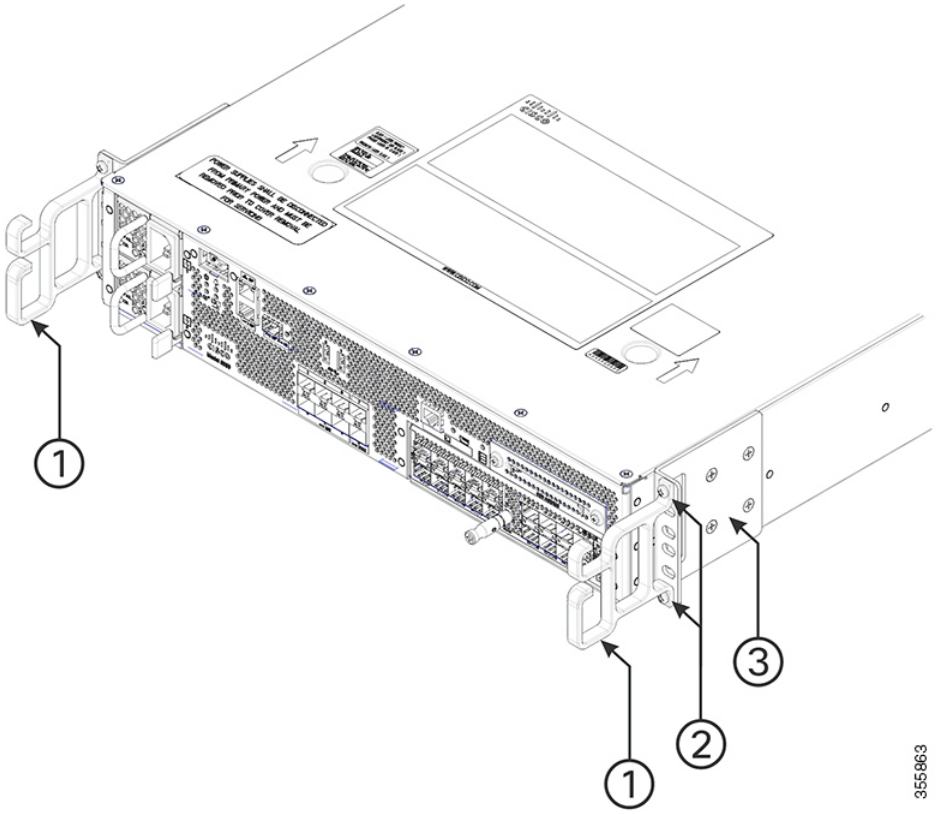


1	Cable-management bracket "U" feature	3	Chassis front rack-mount bracket
2	Cable-management bracket screw		

Note
Use the package of screws that came with your chassis containing four screws.

The following figure shows where to attach the cable-management brackets to the .

Figure 13: Attaching the Cable-Management Brackets to the



1	Cable-management bracket "U" feature	3	Chassis front rack-mount bracket
2	Cable-management bracket screw holes		

Step 3 Insert the cable management screw into the screw hole of the cable-management bracket and into the chassis rack-mount bracket and tighten the screw using a Philips screwdriver.

Step 4 Repeat **step 1** to **step 3** for the other side of the chassis.

Chassis Ground Connection

Warning **This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available**

Statement 1024

Before you connect power or turn on power to your chassis, you must provide an adequate chassis ground (earth) connection for the chassis. A chassis ground connector is provided on each Cisco Catalyst CW9800M Wireless Controller. There is a stud on the rear left side of the chassis.

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last**

Statement 1046

Have the recommended tools and supplies available before you begin this procedure.

Recommended Tools and Supplies

Warning **Use copper conductors only.**

Statement 1025

The following tools, equipment, and supplies are necessary to connect the system ground to the chassis:

- Philips screwdriver
- 3.5-mm flat blade screwdriver (Phoenix # 1205053 or equivalent 3.5-mm flat blade)
- Dual-lug chassis ground component
- Grounding wire

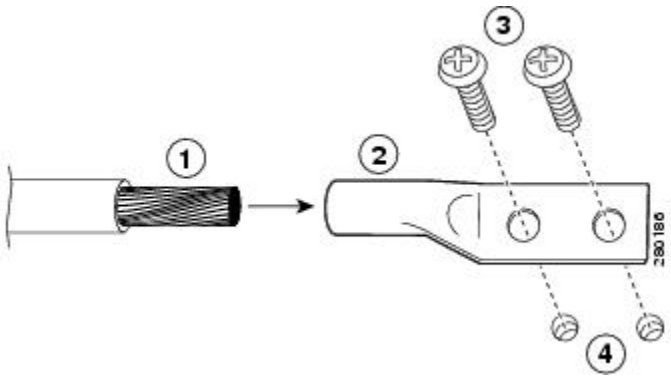
Attaching a Chassis Ground Connection

Procedure

Step 1 Use the wire stripper to strip one end of the AWG #6 wire approximately 0.75 inches (19.05 mm).

Step 2 Insert the AWG #6 wire into the open end of the grounding lug.

Figure 14: Attaching a Grounding Lug to the Chassis Ground Connector



1	Chassis ground lead wire	3	Ground screws
2	Grounding lug	4	Chassis ground connector holes

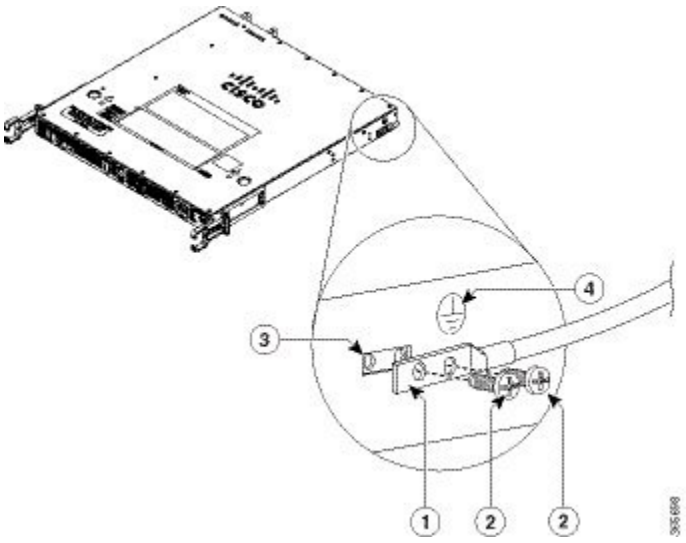
Step 3 Use the crimping tool to carefully crimp the wire receptacle around the wire. This step is required to ensure a proper mechanical connection.

Step 4 Locate the chassis ground connector on the side of your chassis.

Step 5 Insert the two screws through the holes in the grounding lug.

The following figure shows how to attach a grounding lug to the chassis ground connector.

Figure 15: Attaching the Grounding Lug to the Ground Connector of the Cisco Catalyst 9800-H Wirelesss ControllerCisco Catalyst 9800-40 Wireless Controller



1	Chassis ground lug	3	Ground connector on the chassis
2	Grounding screws	4	Ground symbol

Step 6 Use the Number 2 Philips screwdriver to carefully tighten the screws until the grounding lug is held firmly to the chassis. Do not over tighten the screws.

Step 7 Connect the opposite end of the grounding wire to the appropriate grounding point at your site to ensure an adequate chassis ground.

Connecting Cables

Keep the following guidelines in mind when connecting any external cable to the Cisco Catalyst 9800-40 Wireless Controller:

- To reduce the chance of interference, avoid crossing high-power lines with any interface cables.
- Verify all the cabling limitations (particularly distance) before powering on the system.

Connecting the Console Port Cable

The controller uses RJ-45 ports for console port to attach a console terminal. The controller has an asynchronous serial (EIA/TIA-232) RJ-45 console port labeled CON on its front panel. You can connect this port to most types of video terminals with a console cable kit that is included with your controller. The console cable kit contains:

- One RJ-45-to-RJ-45 crossover cable
- One RJ-45-to-DB-9 (female) adapter

The crossover cable reverses pin connections from one end to the other. In other words, it connects pin 1 (at one end) to pin 8 (at the other end), pin 2 to pin 7, pin 3 to pin 6, and so on. You can identify a crossover cable by comparing the two modular ends of the cable. Hold the cable ends in your hand, side-by-side, with the tabs at the back. Ensure that the wire connected to the outside (left) pin of the left plug (pin 1) is the same color as the wire connected to the outside (right) pin of the right plug (pin 8).

The console port is an asynchronous serial port; devices connected to this port must be capable of asynchronous transmission.

Procedure for Connecting the Console Port Cable

Before you begin

Before connecting to the console interface on the controller using a terminal or PC, perform the following steps:

Procedure

Step 1 Before connecting a terminal to the console port, configure the terminal to match the chassis console port as follows: 9600 baud, 8 data bits, no parity, 1 stop bits (9600 8N1).

Step 2 Connect one end of the RJ-45 cable to the serial RJ-45 console port (CON) on the Cisco Catalyst 9800-40 Wireless Controller using the RJ-45 to DB-9 cable. Connect the DB-9 end to your terminal equipment.

Note

For information about how to change the default settings to meet the requirements of your terminal or host, see the *Cisco IOS Terminal Services Configuration Guide*.

Step 3 After you establish normal controller operation, you can disconnect the terminal. Follow the same procedure to connect a video terminal to the console port.

What to do next

Go to the **Connecting to the Mini USB Console Port** section to continue the installation.

Connecting to the Mini USB Console Port

The USB serial console port connects directly to the USB connector of a PC using a USB Type A to 5-pin mini USB Type-B cable. The USB Console supports full speed (12Mbps) operation. The console port does not support hardware flow control.

Note

- Always use shielded USB cables with a properly terminated shield. The USB serial console interface cable must not exceed 3 meters in length.
- Only one console port can be active at a time. When a cable is plugged into the USB console port, the RJ-45 port becomes inactive. Conversely, when the USB cable is removed from the USB port, the RJ-45 port becomes active.
- 4-pin mini USB Type-B connectors are easily confused with 5-pin mini USB Type-B connectors. Note that only the 5-pin mini USB Type-B is supported

The default parameters for the console port are 9600 baud, 8 data bits, no parity, and 1 stop bit.

For operation with a Microsoft Windows OS version older than Windows 7, the Cisco Windows USB Console Driver must be installed on any PC connected to the console port. If the driver is not installed, the prompts guide you through a simple installation process.

The Cisco Windows USB Console Driver allows plugging and unplugging the USB cable from the console port without affecting Windows HyperTerminal operations. No special drivers are needed for Mac OS X or Linux.

Baud rates for the USB console port are 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 bps.

Management Ethernet Port Cable Connection

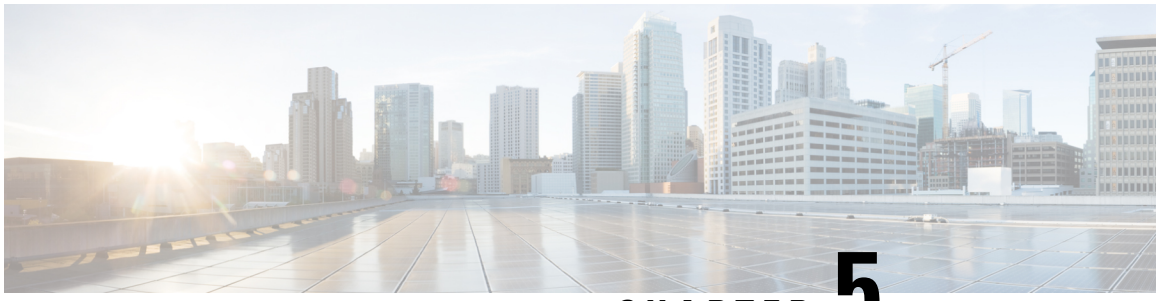
Before you begin

Caution To comply with Class A emission requirements, a shielded Ethernet cable must be used for the connection

Procedure

Step 1 Insert an Ethernet RJ-45 cable into the MGMT port.

Step 2 Insert the other end of the RJ-45 cable to your management device or network.



CHAPTER 5

Power Up and Initial Configuration

This chapter guides you through a basic controller configuration, which is sufficient for you to access your network. Complex configuration procedures are beyond the scope of this publication and can be found in the modular configuration and command reference publications in the Cisco IOS software configuration documentation set that corresponds to the software release installed on your Cisco hardware.

- Checking Conditions Prior to System Startup, on page 51
- Powering Up the Controller, on page 52
- Performing the Initial Configuration on the Controller, on page 54
- Saving Your Controller Configuration, on page 67
- Verifying the Initial Configuration, on page 67
- Powering Off the Controller Safely, on page 68
- Environmental Monitoring and Reporting Functions, on page 69

Checking Conditions Prior to System Startup

Ensure that all the card slots and compartments are closed. Install blank faceplates on empty slots. Always have power supply slots filled. If you leave a power supply slot uncovered, then you risk exposure to hazardous voltages on the power pins on the midplane.

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.**

Statement 1029

Note To view the boot sequence, you must have a console connection to the Cisco Catalyst 9800-40 Wireless Controller before it powers up.

Ensure that the following conditions are addressed before starting up the controller:

- The network interface cable or the optional Management port cable is connected.

- The chassis is securely mounted and grounded.
- The power and interface cables are connected.
- Your PC with terminal emulation program (Putty or equivalent) is connected to the console port, powered up, and is configured for 9600 baud, 8 data bits, 1 stop bit, no parity, with flow control set to none.
- You have selected passwords for access control.
- Captive installation screws are tight on all removable components.
- The console terminal is turned on.
- You have determined the IP addresses for the network interfaces.
- The EPA and the NIM are inserted in their slots, if applicable.

Note The EPA and NIM must be defined.

- Empty card slots are filled with card blanks. This ensures proper air flow through the chassis and electromagnetic compatibility (EMC).

Powering Up the Controller

Before you begin

Before you power on, make sure that:

- The power supply cord is plugged into the power supply inlet.
- All cables are connected.
- Your computer is powered up and connected.

You are now ready to power on the system for the first time.

Procedure

Step 1 Move the chassis power switch to the ON position.

Listen for the fans; you should immediately hear them operating. Ensure that the power supply LED OK is green and the FAIL LED is not illuminated. The front-panel indicator LEDs provide power, activity, and status information useful during bootup. For more detailed information about the LEDs, see the **LEDs** section.

Step 2 Observe the initialization process.

When the system boot is complete (the process takes a few seconds), the controller begins to initialize.

The following is an example of what is displayed during the system boot process:

```
Initializing Hardware ...
```

```
System integrity status: 90170200 12030117


System Bootstrap, Version 16.10(2r), RELEASE SOFTWARE
Copyright (c) 1994-2018  by cisco Systems, Inc.

Current image running: Boot ROM1
Last reset cause: PowerOn

C9800-40-K9 platform with 33554432 Kbytes of main memory

Warning: filesystem is not clean
File size is 0x2ae586e3
Located C9800-40-universalk9_wlc.16.10.01.SPA.bin
Image size 719685347 inode num 15, bks cnt 175705 blk size 8*512
################################################################################
################################################################################
################################################################################
####################################
Boot image size = 719685347 (0x2ae586e3) bytes

ROM:RSA Self Test Passed
ROM:Sha512 Self Test Passed

Package header rev 3 structure detected
Calculating SHA-1 hash...done
validate_package_cs: SHA-1 hash:
        calculated fdf6e062:e7a16041:b642e191:16a8f2b2:a98397f4
        expected   fdf6e062:e7a16041:b642e191:16a8f2b2:a98397f4
Validating main package signatures

RSA Signed RELEASE Image Signature Verification Successful.
Validating subpackage signatures
Image validated
Nov 14 21:21:26.350: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for process
bt_logger
Nov 14 21:21:29.175: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for process
bt_logger

Both links down, not waiting for other chassis
Chassis number is 1
Nov 14 21:21:29.956: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for process
bt_logger
Nov 14 21:21:31.877: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for process
bt_logger
Nov 14 21:21:38.272: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for process
bt_logger
Nov 14 21:21:41.387: %PMAN-3-PROC_EMPTY_EXEC_FILE: R0/0: pvp: Empty executable used for process
bt_logger

             Restricted Rights Legend

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cisco C9800-40-K9 (1GL) processor (revision 1GL) with 7866661K/6147K bytes of memory.
FIPS: Flash Key Check : Found Key , FIPS Mode Enabled

Processor board ID TKM21130895
1 Virtual Ethernet interface
4 Ten Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
33554432K bytes of physical memory.
26910719K bytes of eUSB flash at bootflash:.
234365527K bytes of SATA hard disk at harddisk:.
0K bytes of WebUI ODM Files at webui:.

Base Ethernet MAC Address          : 00:A3:8E:23:7F:40

Installation mode is BUNDLE

%INIT: waited 0 seconds for NVRAM to be available


Press RETURN to get started!
```

Performing the Initial Configuration on the Controller

Using the Cisco IOS-XE CLI - Cisco Setup Command Facility

The **setup** command facility prompts you to enter the information that is needed to configure a controller quickly. The facility takes you through an initial configuration, including wireless configurations.

Note The setup command facility is entered automatically if there is no configuration on the controller when it is booted into Cisco IOS-XE.

You will be prompted for wireless configuration after the Day 0 banner.

For information on modifying the configuration after you create it, see the Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide and the Cisco Catalyst 9800 Series Wireless Controller Command Reference Guide.

This section covers the following:

- Configuring the device management interface.
- Configuring the device management IP.
- Setting a static route.
- Configuring the management credentials.
- Configuring the wireless management interface.
- Choosing the deployment mode.
- Configuring the system name or hostname.
- Configuring credentials for management access on access points.
- Configuring the country code.
- Configuring the time using an NTP server or manually.
- [Optional] Configuring a time zone.
- [Optional] Configuring the wireless client density.
- [Optional] Configuring AAA servers.
- [Optional] Configuring the wireless network settings.
- [Optional] Configuring a network name or SSID.
- [Optional] Configuring a virtual IP.
- [Optional] Configuring an RF network name.
- [Optional] Configuring high avalability.

Note Presently, there is no direct method to get back to your previous configuration. Press **Ctrl-C** to restart the configuration and return to the setup without saving the configuration.

Procedure

Step 1 Navigate to the Day 0 setup wizard using the **write erase** command or directly on the Day 0 device.

Step 2 Device management interface setup configures the device management or service port. This interface enables the basic configuration to access the device using the GUI. This is an optional configuration where you can opt to configure only the wireless management interface and not the device management.

```
Configure device management interface?[yes]:
```

Step 3 Device management IP helps access the device using the GUI.

```
 Configure static IP address? [yes]:
    Enter the interface IP [TenGigabitEthernet0/0/2]: 192.168.1.10
    Enter the subnet mask [TenGigabitEthernet0/0/2] [255.0.0.0]: 255.255.255.0
```

Step 4 Setting a static route to access the device using the GUI.

```
Interface belongs to VRF "Mgmt-intf". Please configure a static route on the VRF
Enter the destination prefix: 0.0.0.0
Enter the destination mask: 0.0.0.0
Enter the forwarding router IP: 10.104.170.1
```

Step 5 Enter the management username and password. This is a mandatory step.

```
Enter the management username: cisco
  Enter the password: ********
  Reenter the password: ********
```

Step 6 Configure the wireless management if you haven't configured a device management interface.

```
Basic management setup is now complete. At this point, it is possible to save the above and
continue wireless setup using the webUI (for this, choose 'no' below)

Would you like to continue with the wireless setup? [yes]: yes
```

Note
This prompt is not applicable for 17.4 release.

Note
If you have not configured the device management, the setup moves to **Step 8** before displaying the above banner.

In 17.3 release, you will be allowed to exit the wizard after configuring at least one of the interfaces, that is, device or wireless management.

This banner is no longer available in 17.4. You cannot exit the wizard without completing the configuration.

If you select **Yes**, you need to follow the upcoming steps. Also, you can access the device using the IP configured in **Step 4**.

Step 7 Wireless management interface is a mandatory configuration:

```
Configuring wireless management interface
  Select interface to be used for wireless management
   1. TenGigabitEthernet0/0/1 [Up]
```

```
  2. TenGigabitEthernet0/0/2 [Up]
  3. TenGigabitEthernet0/0/3 [Up]
Choose the interface to config [1]:
```

Step 8 Enter a VLAN ID:

```
Enter the vlan ID (1-4094): 112
```

Step 9 Configure an IPv4 or IPv6 address:

```
Configure IPv4 address? [yes]:
  Enter the interface IP [TenGigabitEthernet0/0/1]: 9.11.112.40
  Enter the subnet mask [TenGigabitEthernet0/0/1] [255.0.0.0]: 255.255.255.0
Configure IPv6 address? [yes]: no
```

Step 10 Configure a VLAN DHCP server and IP address:

```
Do you want to configure a VLAN DHCP Server? [yes]: yes
  Enter the VLAN DHCP Server IP [TenGigabitEthernet0/0/1]: 9.11.112.45
```

Step 11 [Optional] Set up a static route to attach an AP client to the controller. The default options for static route prompts you to configure a default route. However, you can specify a different route as well.

```
Configure static route? [yes/no]: yes
 Enter the destination prefix [0.0.0.0]:
 Enter the destination mask [0.0.0.0]:
 Enter the forwarding router IP: 9.11.112.1
```

Note
If you configure the device as HA RMI and you haven't configured a default route (that is, source and destination as 0.0.0.0), the wizard asks for the default route information.

```
Basic management setup is now complete. At this point, it is possible to save the above and
continue wireless setup using the webUI(for this, choose 'no' below)

Would you like to continue with the wireless setup? [yes]
```

Step 12 Choose the deployment mode:

```
Choose the deployment mode
   1. Standalone
   2. Active
   3. Standby
Enter your selection [1]:
```

Note
You can choose from one of the following deployment modes:

- **Standalone**: In this mode, you do not get to view any high availability pairing information.
- **Active**: In this mode, the controller needs to be configured with all the Day 0 information.
- **Standby**: In this mode, the configuration proceeds to the **High Availability** configuration.

Step 13 Configure the system name or hostname:

```
Enter the hostname [WLC]: ciscowlc
```

Note
This is a mandatory step. The hostname needs to confirm to the RFC standards.

Step 14 [Optional] Configure the login credentials for an AP.

```
Configure credentials for management access on Access Points? [yes]:
  Enter the management username: cisco
  Enter the management password: ****
    Reenter the password: ****
  Enter the privileged mode access password: ****
    Reenter the password: ****
```

Step 15 Configure the country code. You can specify multiple country codes by separating them with a comma.

```
Configure country code for wireless operation in ISO format ? [US]:
```

Step 16 Configure the date and NTP to allow access points to join the controller. You can configure time using an NTP server or manually.

Note
You need to enter time in the following format:

DAY-MONTH-YEAR

```
Configure NTP server ? [yes/no]: no
Enter the day:
Enter the month:
Enter the year:

Configure a NTP server now? [yes]:
Enter ntp server address : 9.11.112.45
Enter a polling interval between 16 and 131072 secs which is power of 2: 16
```

Step 17 [Optional] Configure a timezone:

```
 Configure timezone? [yes]:
  Enter name of timezone: ind
  Enter hours offset from UTC (-23,23): 5
  Enter mins offset from UTC (0,59) [0]: 30
```

Step 18 [Optional] Configure the expected client density:

```
 Configure Wireless client density? [yes]:
  Choose the client density
    1. Low
    2. Typical
    3. High
  Enter your selection [2]: 3
```

Step 19 [Optional] Configure AAA servers:

Note
You can configure a maximum of 6 servers during Day 0 configuration.

```
 Configure AAA servers? [yes]:
  Enter the AAA server address: 9.11.112.46
  Enter the AAA key: ***
Do you want to add more AAA servers? [yes]:
```

```
  Enter the AAA server address: 9.11.112.47
  Enter the AAA key: ***
Do you want to add more AAA servers? [yes]: no
```

Note
The AAA servers are required for WPA2 Enterprise. In 17.4 release, you need to configure AAA only in one place. If you follow **Step 21**, WPA2 Enterprise will not ask for AAA servers in **Step 22**.

Step 20 [Optional] Configure wireless network settings to configure WLAN information for an AP and client join:

```
Configure Wireless network settings? [yes]:
```

Step 21 [Optional] Configure an SSID for client join:

```
Enter the network name or service set identifier (SSID):
Choose the network type
    1. Employee
    2. Guest
```

If you choose **Employee** as the network type, the following options are displayed:

```
Choose the security type
    1. WPA Personal
    2. WPA Enterprise
   Enter your selection [2]:
```

If you choose **WPA2 Personal**, you will need to enter a pre-shared key (ASCII).

```
Enter the pre-shared key (ASCII):
```

If you choose **WPA2 Enterprise**, you will be able to add multiple AAA servers.

```
Enter the AAA server address:
Enter the AAA key:
Enter more AAA server details? [yes]
```

If you choose **Guest**, you get to view the following options:

```
Please choose the security type:
1. Webauth
2. Authbypass
3. Consent
4. Webconsent
Enter the security type:
```

Step 22 [Optional] Configure a virtual IP address. The recommended virtual IP address is 192.0.2.1.

```
 Configure virtual IP? [yes]:
  Enter the virtual IP [192.0.6.1]:
```

Step 23 [Optional] Configure an RF network name.

```
 Configure RF-Network Name? [yes]:
  Enter the RF-Network Name: ciscorf
```

Step 24 [Optional] Configure high availability.

If you choose the deployment mode as Active or Standby, you will need to choose from one of the HA pairing type:

a. RMI

b. RP-RP

Note
For information on HA pairing types, see **Part: High Availability (High Availability > Information About Redundancy Management Interface)** in *Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide, Cisco IOS XE Bengaluru 17.4.x*.

```
High Availability configuration
 Please choose the HA pairing type
   1. RMI
   2. RP-RP
 Enter your selection [1]:
```

If you choose RMI+RP, you need to select an interface to be used as redundancy port:

```
Enter the RMI IP for local chassis: 9.11.112.12
Enter the RMI IP for remote chassis: 9.11.112.13
Enter the gateway IP of the last resort: 9.11.112.1
```

Note
If you have not configured a default route earlier, you need to enter the gateway IP of the last resort.

If you choose the deployment mode as Standby, you need to specify the VLAN ID for completing the pairing:

```
 Enter the RMI IP for local chassis: 9.11.112.51
 Enter the RMI IP for remote chassis: 9.11.112.50
 Enter the wireless management VLAN: 112
```

If you choose RP, you need to select an interface to be used as redundancy port:

```
Select interface to be used as redundancy port
  1. TenGigabitEthernet0/0/2 [Up]
  2. TenGigabitEthernet0/0/3 [Up]
 Choose the interface to config [1]: 2
 Enter the local IP:
Enter the subnet mask:
Enter the remote IP:
```

Completing the Configuration

When using the Cisco setup command facility, and after you have provided all the information requested by the facility as described in **Using the Cisco setup Command Facility** section, the final configuration appears.

To complete your controller configuration, follow these steps.

Procedure

Step 1 The facility prompts you to save the configuration.

- If you answer **no**, the configuration information you entered is not saved, and you return to the controller enable prompt (**WLC#**). Enter **setup** to return to the System Configuration dialog box.

- If you answer **yes**, the configuration is saved, and you are returned to the user EXEC prompt (`WLC>`).

```
Use this configuration? {yes/no} : yes
Building configuration...
Use the enabled mode 'configure' command to modify this configuration.

%LINK-3-UPDOWN: Interface GigabitEthernet0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1/0, changed state to up

<Additional messages omitted.>
```

Step 2 When messages stop appearing on your screen, press Return to get the `WLC>` prompt.

Step 3 The `WLC>` prompt indicates that you are now at the command-line interface (CLI).

You have just completed an initial controller configuration. Note that this is not a complete configuration. At this point, you have two choices:

- Run the setup command facility again, and create another configuration:

```
WLC> enable
Password: password
WLC# setup
```

- Modify the existing configuration or configure additional features by using the CLI:

```
WLC> enable
Password:  password
WLC# configure terminal
WLC(config)#
```

Using the Cisco IOS-XE CLI—Manual Configuration

This section shows you how to access the CLI to perform the initial configuration on the controller

If the system configuration message does not appear, it means a default configuration file was installed on the controller prior to shipping.

Follow these steps to configure the controller.

Procedure

Step 1 Enter **no** when the following system message appears on the controller.

```
--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no
```

Step 2 Press **Return** and continue with the manual configuration:

Several log messages are displayed.

Step 3 Press **Return** to bring up the `WLC>` prompt

Step 4 Type **enable** to enter privileged EXEC mode.

```
WLC> enable
WLC#
```

Configuring the Controller Hostname

Note The Cisco Catalyst 9800-40 Wireless Controller provides a simplified first time out-of-box installation and configuration interface for all series of wireless controllers.

To learn more about the Day 0 Express setup on the Cisco Catalyst 9800-40 Wireless Controller, please refer https://www.cisco.com/c/en/us/td/docs/wireless/controller/technotes/8-8/b_c9800_wireless_controller_series_web_dg.html

Note If you prefer to configure the device manually, you need to configure the following to terminate the Day0 Wizard:

- Wireless management interface
- AP country code must be set

The hostname used in CLI prompts the default configuration filenames. If you do not configure the controller hostname, the controller uses the factory-assigned default hostname **WLC**.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `WLC> enable`	Enables privileged EXEC mode. **Note** Enter your password if prompted.
Step 2	**configure terminal** **Example:** `WLC# configure terminal`	Enters global configuration mode.
Step 3	**hostname** *name* **Example:** `WLC(config)# hostname myWLC`	Specifies or modifies the hostname for the network server.
Step 4	**end** **Example:** `myWLC(config)# end`	(Optional) Returns to privileged EXEC mode.

Configuring the Enable and Enable Secret Passwords

To provide an additional layer of security, particularly for passwords that cross the network or are stored on a TFTP server, you can use either the **enable password** command or **enable secret** command. Both commands accomplish the same thing—they allow you to establish an encrypted password that users must enter to access privileged EXEC (enable) mode.

We recommend that you use the **enable secret** command because it uses an improved encryption algorithm.



Note If you configure the enable secret command, it takes precedence over the enable password command; the two commands cannot be in effect simultaneously.

For more information, see the **Configuring Passwords and Privileges** chapter in the *Cisco IOS Security Configuration Guide*. Also see the **Cisco IOS Password Encryption Facts** tech note and the **Cisco Guide to Harden Cisco IOS Devices** tech note.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. **Note** Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**enable secret** *password* **Example:** `Device(config)# enable secret greentree`	Specifies an additional layer of security over the **enable password** command.
Step 4	**end** **Example:** `Device(config)# end`	Returns to privileged EXEC mode.
Step 5	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Verify that your new enable or enable secret password works.
Step 6	**end** **Example:** `Device(config)# end`	(Optional) Returns to privileged EXEC mode.

Configuring the Console Idle Privileged EXEC Timeout

By default, the privileged EXEC command interpreter waits 10 minutes to detect user input before timing out.

When you configure the console line, you can also set communication parameters, specify autobaud connections, and configure terminal operating parameters for the terminal that you are using. For more information on configuring the console line, see the *Cisco IOS Configuration Fundamentals and Network Management Configuration Guide*. In particular, see the *Configuring Operating Characteristics for Terminals* and *Troubleshooting and Fault Management* chapters.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. **Note** Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**line console 0** **Example:** `Device(config)# line console 0`	Configures the console line and starts the line configuration command collection mode.
Step 4	**exec-timeout** *minutes* [*seconds*] **Example:** `Device(config)# exec-timeout 0 0`	Sets the idle privileged EXEC timeout, which is the interval that the privileged EXEC command interpreter waits until user input is detected. The example shows how to specify no timeout. Setting the exec-timeout value to 0 will cause the controller to never log out once logged in. This could have security implications if you leave the console without manually logging out using the disable command.
Step 5	**end** **Example:** `Device(config)# end`	Returns to privileged EXEC mode.
Step 6	**show running-config** **Example:** `Device# show running-config`	Displays the running configuration file. Verify that you have configured the idle privileged EXEC timeout correctly.

Example

The following example shows how to set the console idle privileged EXEC timeout to 2 minutes 30 seconds:

```
line console
exec-timeout 2 30
```

The following example shows how to set the console idle privileged EXEC timeout to 30 seconds:

```
line console
exec-timeout 0 30
```

Gigabit Ethernet Management Interface Overview

The controller provides an Ethernet management port named GigabitEthernet0.

The purpose of this interface is to allow users to perform management tasks on the controller; it is an interface that should not, and often cannot, forward network traffic, but can be used to access the controller through Telnet and SSH to perform management tasks on the controller. The interface is most useful in troubleshooting scenarios when other forwarding interfaces are inactive.

The following aspects of the management Ethernet interface should be noted:

- The controller has one management Ethernet interface named GigabitEthernet0.
- IPv4, IPv6, and ARP are the only routed protocols supported for the interface.
- The interface provides a way to access the controller even if forwarding interfaces are not functional, or the Cisco IOS is down.
- The management Ethernet interface is part of its own VRF. See the *Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide* for more details.

Default Gigabit Ethernet Configuration

By default, a forwarding VRF is configured for the interface with a special group named Mgmt-intf. This cannot be changed. This isolates the traffic on the management interface away from the forwarding plane. Otherwise, the interface can be configured like other Gigabit Ethernet interfaces for most functions.

For example, the default configuration is as follows:

```
interface GigabitEthernet0
vrf forwarding Mgmt-intf
ip address 200.165.200.225 255.255.255.224
negotiation auto
```

Note The controller does not support front-panel networking. You can enter the guest shell commands with in the controller's terminal, but you cannot configure NAT on the controller. Therefore, this type of networking does not work. Only management mode (Mgmt-intf VRF) is supported.

Configuring Gigabit Ethernet Interfaces

This section shows how to assign an IP address and interface description to an Ethernet interface on your controller.

For comprehensive configuration information on Gigabit Ethernet interfaces, see the **Configuring LAN Interfaces** chapter of the *Cisco IOS Interface and Hardware Component Configuration Guide*.

For information on the interface numbering, see the *Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide*.



Note For comprehensive configuration information about IP routing and IP routing protocols, see the **Configuring IP Routing Protocol-Independent Feature** on **cisco.com**.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. **Note** Enter your password if prompted.
Step 2	**show ip interface brief** **Example:** `Device# show ip interface brief`	Displays a brief status of the interfaces that are configured for IP. Learn which type of Ethernet interface is on your controller.
Step 3	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 4	**interface gigabitethernet 0** **Example:** `Device(config)# interface gigabitethernet 0`	Specifies the Ethernet interface and enters the interface configuration mode.
Step 5	**ip address** *ip-address mask* **Example:** `Device(config-if)# ip address 209.165.200.240 255.255.255.224`	Sets a primary IP address for an interface.
Step 6	**no shutdown** **Example:** `Device(config-if)# no shutdown`	Enables an interface.
Step 7	**end** **Example:** `Device(config-if)# end`	Returns to privileged EXEC mode.
Step 8	**show ip interface brief** **Example:** `Device# show ip interface brief`	Displays a brief status of the interfaces that are configured for IP. Verify that the interfaces are up and configured correctly.

Saving Your Controller Configuration

This section describes how to avoid losing your configuration at the next system reload or power cycle by saving the running configuration to the startup configuration in NVRAM. The NVRAM provides 32 MB of storage on the controller.

Note To aid file recovery and minimize downtime in case of file corruption, we recommend that you save backup copies of the startup configuration file and the Cisco IOS-XE software system image file on a server

Note To avoid losing work you have completed, be sure to save your configuration occasionally as you proceed. Use the **copy running-config startup-config** command to save the configuration to NVRAM.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. **Note** Enter your password if prompted.
Step 2	**copy running-config startup-config** **Example:** `Device# copy running-config startup-config`	Saves the running configuration to the startup configuration.

Verifying the Initial Configuration

Enter the following commands in Cisco IOS-XE to verify the initial configuration on the controller:

- **show version**—Displays the system hardware version, the installed software version, the names and sources of configuration files, the boot images, and the amount of installed DRAM, NVRAM, and flash memory.
- **show diag**—Lists and displays the chassis, slot location, and subslot location details.
- **show interfaces**— Shows if interfaces are operating correctly and if interfaces and line protocols are in the correct state, either up or down.
- **show ip interface brief**—Displays a summary of the interfaces configured for IP protocol.
- **show configuration**—Helps verify if you have configured the correct hostname and password.

After you have completed and verified the initial configuration, the specific features and functions are ready to be configured. See the *Cisco Catalyst 9800 Series Wireless Controller Software Configuration Guide*.

Powering Off the Controller Safely

Before you begin

We recommend that before turning off all power to the chassis, you issue the **reload** command. This ensures that the operating system cleans up all the file systems.

Procedure

Step 1 Change the controller **config-register** by issuing the following commands:

```
wlc#
wlc# conf t
wlc(config)# config-register 0x2100
```

Step 2 Save the controller configuration using the following command:

```
wlc# write memory
```

Step 3 Enter the **reload** command.

Step 4 Confirm the reload command:

```
wlc# reload

Reload command is being issued on Active unit, this will reload the whole stack
Proceed with reload? [confirm]
Chassis 1 reloading, reason - Reload command
Feb  6 19:50:38.556: %PMAN-5-EXITACTION: F0/0: pvp: Process manager is exiting:
Feb  6 19:5
Initializing Hardware ...
System integrity status: 90170200 21030107
```

Step 5 After confirming the reload command, wait until the system bootstrap message is displayed before powering off the system:

```
System Bootstrap, Version 12.2(20170919:091604)
[pand16_7_v2 101], DEVELOPMENT SOFTWARE
Copyright (c) 1994-2017  by cisco Systems, Inc.
Compiled Tue 09/19/2017  2:21:10.32 by pand
Current image running: Boot ROM0
Last reset cause: LocalSoft
QWLC-1GL platform with 33554432 Kbytes of main memory
rommon 1 >
```

Step 6 Move the chassis power switch to the Standby position.

Note
The fans in the power supply modules will continue to run even if the chassis power switch is in the Standby position.

Note
After powering off the controller, wait for a minimum of 30 seconds before powering it on again.

Environmental Monitoring and Reporting Functions

Environmental monitoring and reporting functions allow you to maintain normal system operation by identifying and resolving adverse conditions prior to loss of operation.

Caution To prevent overheating of the chassis, ensure that your system is drawing cool inlet air. Over temperature conditions may occur if the system is drawing in the exhaust air of other equipment. Ensure adequate clearance around the sides of the chassis so that cooling air can flow through the chassis interior unimpeded and exhaust air exits the chassis and is not drawn into the inlet vent of another device.

Alarm Monitoring

The Cisco Catalyst 9800-40 Wireless Controller displays the CRIT, MAJ, and MIN alarm indicator LEDs. These LEDs indicate controller status at all times, but you must directly observe these LEDs to become aware of a controller alarm condition. Additionally, you can use the **show facility-alarm status** command to view the alarms.

Note To clear the the alarm LED, you need to shutdown the ports which are not connected.

```
wlc# show facility-alarm status
System Totals  Critical: 1  Major: 0  Minor: 0
Source                    Time                 Severity    Description [Index]
------                    ------               -------    -------------------
Power Supply Bay 1        Feb 09 2018  20:52:48  CRITICAL  Power Supply/FAN Module Missing
xcvr container 0/0/0      Feb 09 2018  20:53:09  INFO    Transceiver Missing [0]
TenGigabitEthernet0/0/1   Feb 09 2018  20:53:11  INFO    Physical Port Administrative State
 Down [67]
TenGigaEthernet0/0/2      Feb 09 2018  20:53:12  INFO    Physical Port Administrative State
 Down [67]
```

To clear a visual alarm, you must resolve the alarm condition. The **clear facility-alarm** command does not clear an alarm LED on the Cisco Catalyst 9800-40 Wireless Controller .

Environmental Monitoring

The environmental monitoring functions use sensors to monitor the temperature of the cooling air as it moves through the chassis.

The local power supplies provide the ability to monitor:

- Input and output voltage
- Output current
- Outlet temperature

The **Cisco Catalyst 9800-40 Wireless Controllers** are expected to meet the following environmental operating conditions:

- Operating Temperature Nominal: 32° to 104° F (0° to 40°C)
- Operating Temperature Short Term: 32° to 131° F (0° to 50°C)
- Operating Humidity Nominal (relative humidity): 10 to 90% relative
- Operating Humidity Short Term: 5 to 90% relative
- Operating Altitude: –500 to 10,000 feet (–152.4 to 3048 meters)
- AC Input Range: 85 to 264 VAC

In addition, the power supplies monitor internal power supply temperatures and voltages. A power supply is either within tolerance (normal) or out of tolerance (critical). If an internal power supply temperature or voltage reaches a critical level, the power supply shuts down without any interaction with the system processor.

The environmental monitoring functions use the following levels of status conditions to monitor the system:

- **Normal**—All monitored parameters are within normal tolerances.
- **Warning**—The system has exceeded a specified threshold. The system continues to operate, but operator action is recommended to bring the system back to a normal state.
- **Critical**—An out-of-tolerance temperature or voltage condition exists. The system continues to operate, but the system is approaching shutdown. Immediate operator action is required.
- **Shutdown**—Before any shutdown, the system logs the status of monitored parameters in NVRAM so that you can retrieve it later to help determine the cause of the problem.
- **Power supply shutdown**—The power supply detected an internal out-of-tolerance overvoltage, overcurrent, or temperature condition and shut itself down.

Fan Failures

Four internal fans draw cooling air in through the front of the chassis and across internal components to maintain an acceptable operating temperature. The fans are located at the rear of the chassis. The fans in the Cisco Catalyst 9800-40 Wireless Controller are numbered from 0 to 5, right to left.

When the system power is on, all fans should be operational. However, the system continues to operate even if a fan fails.

Use the **show platform hardware slot chassis 1 P2 fan status** command to view the status of the fans, for example:

```
WLC# show platform hardware slot chassis 1 P2 fan status
Fan group 1 speed: 40%
Fan 0: Normal
Fan 1: Normal
Fan 2: Normal
Fan 3: Normal
Fan 4: Normal
Fan 5: Normal
```

Reporting Functions

The chassis manager on the forwarding engine control processor manages the local resources of the forwarding processor. The Cisco Catalyst 9800-40 Wireless Controller displays warning messages on the console, if the chassis interface-monitored parameters exceed a threshold. You can also retrieve and display environmental status reports with the following commands:

- **show environment all**
- **show version**
- **show inventory**
- **show platform**
- **show platform software status control-processor**
- **show diag**

Parameters are measured and reporting functions are updated every 60 seconds. A brief description of each of these commands follows.

show environment all Command

The **show environment all** command displays temperature, voltage, fan, and power supply information.

The following is sample output from the **show environment all** command:

```
WLC# show environment all
Sensor List:  Environmental Monitoring
Sensor        Location     State            Reading
Vin              P0        Normal           228 V AC
Iin              P0        Normal           1 A
Vout             P0        Normal           12 V DC
Iout             P0        Normal           18 A
Temp1            P0        Normal           36 Celsius
Temp2            P0        Normal           49 Celsius
Temp3            P0        Normal           47 Celsius
VRRX1: VX1       R0        Normal           752 mV
VRRX1: VX2       R0        Normal           7021 mV
VRRX1: VX3       R0        Normal           1217 mV
VRRX1: VX5       R0        Normal           1217 mV
VRRX1: VP1       R0        Normal           1699 mV
VRRX1: VP2       R0        Normal           2505 mV
VRRX1: VP3       R0        Normal           1305 mV
VRRX1: VP4       R0        Normal           5094 mV
VRRX1: VH        R0        Normal           12008 mV
VRRX2: VX1       R0        Normal           852 mV
VRRX2: VX4       R0        Normal           1018 mV
VRRX2: VX5       R0        Normal           1017 mV
VRRX2: VP1       R0        Normal           3325 mV
VRRX2: VP3       R0        Normal           1815 mV
VRRX2: VP4       R0        Normal           1052 mV
VRRX2: VH        R0        Normal           12008 mV
VRRX3: VX1       R0        Normal           986 mV
VRRX3: VX2       R0        Normal           1006 mV
VRRX3: VX4       R0        Normal           752 mV
VRRX3: VX5       R0        Normal           749 mV
VRRX3: VP1       R0        Normal           2497 mV
VRRX3: VP2       R0        Normal           1193 mV
VRRX3: VP3       R0        Normal           1515 mV
VRRX3: VP4       R0        Normal           11998 mV
Temp: RCRX IN    R0        Normal           29 Celsius
Temp: RCRX OUT   R0        Normal           34 Celsius
Temp: Yoda       R0        Normal           37 Celsius
Temp: XEPhy      R0        Normal           29 Celsius
Temp: CPU Die    R0        Minor            55 Celsius
Temp: FC FANS    R0        Fan Speed 60%    29 Celsius
```

show version Command

The **show version** command displays the system hardware configuration, software version, and names and sources of configuration files and boot images.

The following is sample output from the **show version** command:

```
WLC# show version
Cisco IOS XE Software, Version BLD_POLARIS_DEV_LATEST_20180204_164931
Cisco IOS Software [Fuji], WLC9000 Software (X86_64_LINUX_IOSD-UNIVERSALK9_WLC-M),
Experimental Version 16.9.20180204:170500
[polaris_dev-/nobackup/mcpre/BLD-BLD_POLARIS_DEV_LATEST_20180204_164931 150]
Copyright (c) 1986-2018 by Cisco Systems, Inc.
Compiled Sun 04-Feb-18 14:54 by mcpre
Cisco IOS-XE software, Copyright (c) 2005-2018 by cisco Systems, Inc.
All rights reserved.  Certain components of Cisco IOS-XE software are
licensed under the GNU General Public License ("GPL") Version 2.0.  The
software code licensed under GPL Version 2.0 is free software that comes
with ABSOLUTELY NO WARRANTY.  You can redistribute and/or modify such
GPL code under the terms of GPL Version 2.0.  For more details, see the
documentation or "License Notice" file accompanying the IOS-XE software,
or the applicable URL provided on the flyer accompanying the IOS-XE
software.

ROM: IOS-XE ROMMON

myWLC uptime is 4 minutes
Uptime for this control processor is 7 minutes
System returned to ROM by Reload reason not captured
System image file is
"bootflash:qwlc-universalk9_wlc.BLD_POLARIS_DEV_LATEST_20180204_164931.SSA.bin"
Last reload reason: Reload reason not captured
This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

License Type: Default. No valid license found.
License Level: adventerprise
Next reload license Level: adventerprise

cisco C9800-40-K9 (1GL) processor (revision 1GL) with 1637390K/6147K bytes of memory.
Processor board ID TKM20480022
1 Virtual Ethernet interface
4 Ten Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
33554432K bytes of physical memory.
30056447K bytes of eUSB flash at bootflash:.
0K bytes of WebUI ODM Files at webui:.

Base Ethernet MAC Address          : 00:2C:C8:A5:31:80

Installation mode is BUNDLE
```

```
Configuration register is 0x0

WLC#
```

show inventory Command

The **show inventory** command displays an extended report that includes the product inventory listing of all the Cisco products installed in the networking device.

The following is sample output from the **show inventory** command:

```
WLC# show inventory
NAME: "Chassis", DESCR: "Cisco C9800-40-K9 Chassis"
PID: C9800-40-K9     , VID: V01  , SN: TKM20480022

NAME: "Power Supply Module 0", DESCR: "Cisco 750 Watt reverse-airflow AC power supply"
PID: C9800-AC-750W-R  , VID: V01  , SN: ART203511UA

NAME: "Fan Tray", DESCR: "Cisco C9800-40-K9 Fan Tray"
PID: C9800-40-K9-FAN   , VID:      , SN:

NAME: "module 0", DESCR: "Cisco C9800-40-K9 Modular Interface Processor"
PID: C9800-40-K9     , VID:      , SN:

NAME: "SPA subslot 0/0", DESCR: "4-port 10G/1G multirate Ethernet Port Adapter"
PID: BUILT-IN-4X10G/1G , VID: N/A  , SN: JAE87654321

NAME: "module R0", DESCR: "Cisco C9800-40-K9 Route Processor"
PID: C9800-40-K9     , VID: V01  , SN: TKM20480022

NAME: "module F0", DESCR: "Cisco C9800-40-K9 Embedded Services Processor"
PID: C9800-40-K9     , VID:      , SN:


WLC#
```

show platform Command

The **show platform** command displays platform information.

The following is sample output from the **show platform** command:

```
WLC# show platform
Chassis type: C9800-40-K9
Slot         Type                State                 Insert time (ago)
------ ------------------- ---------------------- -----------------
 0       C9800-40-K9               ok                  00:06:38
0/0     BUILT-IN-4X10G/1G          ok                  00:05:16
R0      C9800-40-K9              ok, active            00:06:38
F0      C9800-40-K9              ok, active            00:06:38
P0      C9800-AC-750W-R            ok                  00:06:10
P1       Unknown                 ps, fail              never
P2       C9800-40-K9-FAN           ok                  00:06:11


Slot       CPLD Version          Firmware Version
--------- ------------------- ---------------------------------------
0          17083013            12.2(20180122:130204) [pand-1GL_imag...
R0          N/A                 N/A
F0         17083013            12.2(20180122:130204) [pand-1GL_imag...
WLC#
```

show platform software status control-processor Command

The **show platform software status control-processor** command displays the average load, memory usage, and CPU utilization levels at which the controller is running. The output also specifies whether the levels of these system health parameters are within defined thresholds.

The following is sample output from the **show platform software status control-processor** command:

```
WLC# show platform software status control-processor
1-RP0: online, statistics updated 4 seconds ago
Load Average: healthy
  1-Min: 1.27, status: healthy, under 8.00
  5-Min: 1.31, status: healthy, under 8.00
  15-Min: 0.76, status: healthy, under 10.00
Memory (kb): healthy
  Total: 32516344
  Used: 3871416 (12%), status: healthy
  Free: 28644928 (88%)
  Committed: 4101932 (13%), under 95%
Per-core Statistics
CPU0: CPU Utilization (percentage of time spent)
User:  2.30, System:  5.40, Nice:  0.00, Idle: 92.30
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU1: CPU Utilization (percentage of time spent)
User:  5.60, System: 18.70, Nice:  0.00, Idle: 75.70
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU2: CPU Utilization (percentage of time spent)
User:  4.00, System: 11.71, Nice:  0.00, Idle: 84.28
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU3: CPU Utilization (percentage of time spent)
User:  3.19, System:  5.69, Nice:  0.00, Idle: 91.10
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU4: CPU Utilization (percentage of time spent)
User:  1.90, System:  5.40, Nice:  0.00, Idle: 92.69
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU5: CPU Utilization (percentage of time spent)
User:  4.60, System: 11.41, Nice:  0.00, Idle: 83.98
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU6: CPU Utilization (percentage of time spent)
User:  1.30, System:  3.40, Nice:  0.00, Idle: 95.29
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU7: CPU Utilization (percentage of time spent)
User:  6.10, System: 14.60, Nice:  0.00, Idle: 79.30
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU8: CPU Utilization (percentage of time spent)
User:  0.30, System:  1.40, Nice:  0.00, Idle: 98.30
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU9: CPU Utilization (percentage of time spent)
User:  0.30, System:  1.30, Nice:  0.00, Idle: 98.40
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU10: CPU Utilization (percentage of time spent)
User:  0.20, System:  0.20, Nice:  0.00, Idle: 99.60
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU11: CPU Utilization (percentage of time spent)
User:  0.10, System:  0.40, Nice:  0.00, Idle: 99.50
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU12: CPU Utilization (percentage of time spent)
User:  0.40, System:  0.90, Nice:  0.00, Idle: 98.70
IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU13: CPU Utilization (percentage of time spent)
User:  0.10, System:  0.30, Nice:  0.00, Idle: 99.59
  IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU14: CPU Utilization (percentage of time spent)
User:  0.19, System:  0.99, Nice:  0.00, Idle: 98.80
```

```
 IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
CPU15: CPU Utilization (percentage of time spent)
User:  0.10, System:  0.30, Nice:  0.00, Idle: 99.60
  IRQ:  0.00, SIRQ:  0.00, IOwait:  0.00
```

show diag chassis eeprom detail Command

The **show diag chassis eeprom detail** command displays the configuration hardware information, including power or fan module P0 and P1 EPPROM data.



Note To reset the device to its factory defaults, perform the following:

1. Open the controller console on PUTTY and reload the controller.
2. When you get ################## while the image loads, right-click on the top ribbon and select **special command** and **break** to get the ROMMON prompt.
3. Issue the following command:

   ```
   rommon 1 > confreg 0x8000
   ```

4. Boot the image.

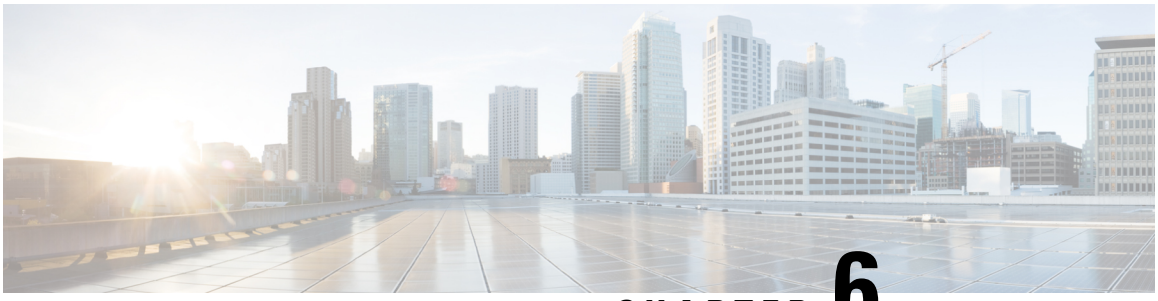
   You will be able to view the write erased configuration and load the image thereafter.
5. After the image loads, you get to view the configuration back to 0x2102.

The following is sample output from the **show diag chassis eeprom detail** command:

```
WLC#: show diag chassis eeprom detail
MIDPLANE EEPROM data:
EEPROM version: 4
Compatible Type: 0xFF
Controller Type: 4103
Hardware Revision: 0.1
PCB Part Number: XX-XXXX-XX
Board Revision: 01
Deviation Number: 0-0
Fab Version: 03
PCB Serial Number: XXXXXXXXXX
RMA Test History: 00
RMA Number: 0-0-0-0
RMA History: 00
Top Assy. Part Number: XX-XXXX-XX
CLEI Code: XXXXXXXXXX
Product Identifier (PID): C9800-40-K9
Version Identifier (VID): V01
Manufacturing Test Data:       00 00 00 00 00 00 00  00
Field Diagnostics Data:        00 00 00 00 00 00 00  00
Chassis MAC Address: 002c.c8a5.3180
MAC Address block size: 32
Chassis Serial Number: XXXXXXXXXX
Environment Monitor Data: 00 06 00 FA
Asset ID:
Power/Fan Module P0 EEPROM data:

EEPROM version: 4
Compatible Type: 0xFF
Hardware Revision: 1.0
Version Identifier (VID): V01
```

```
Product Identifier (PID): C9800-AC-750W-R
PCB Serial Number: XXXXXXXXXX
Top Assy. Part Number: 3XX-XXXX-XX
Board Revision: A0
Deviation Number: 0-0
RMA Test History: 00
RMA Number: 0-0-0-0
RMA History: 00
CLEI Code: XXXXXXXXXX
Manufacturing Test Data:    00 00 00 00 00 00 00  00
Field Diagnostics Data:     00 00 00 00 00 00 00  00
Unknown Field (type 00DA):  00 00 00 00 00 00 00  00
    00 00 00 00 00 00 00  00
Asset ID:
Power Supply Type: AC
Environment Monitor Data:   00 08 00 F8
Environment Monitor Data:   02 A5 2E E2 EE 00 5B
Environment Monitor Data:   05 02 03 50 03 58 00 4B
Platform features:   00 00 03 56 1E 53  0F  2A
   00 00 00 00 00 00  00  00
   FD
Power/Fan Module P1 EEPROM data is not initialized
```



CHAPTER 6

License Verification

This chapter provides information about verifying the Cisco IOS license level and viewing the Cisco Catalyst 9800-40 Wireless Controller license.

- Viewing the Cisco IOS License Level, on page 77
- Viewing License Information, on page 78
- Evaluation License Features, on page 78

Viewing the Cisco IOS License Level

Use the **show version** command to determine the Cisco IOS license level in the controller.

Example:

```
Device# show version | section License

licensed under the GNU General Public License ("GPL") Version 2.0.  The
documentation or "License Notice" file accompanying the IOS-XE software,
License Type: Smart License is permanent
License Level: adventerprise
AIR License Level: AIR DNA Advantage
```

Table 10: Show version Command Output Description

Field Name	Description
License Level: adventerprise	Indicates the current Cisco IOS license code level.
License Type: Smart License is permanent	Indicates the type of license that is used. This example shows that the Cisco Smart license is used that provides floating licenses for your user account. Other license types could be: Permanent (purchased) license or an Evaluation 60-day license.
AIR License Level: AIR DNA Advantage	Indicates the AIR network advantage license level.

Use the **show running-config** command or the **show startup-config** command to view the license-level information. The following example displays sample output from the **show running-config** command:

```
WLC# show running-config
.
.
.
license boot level adventerprise
```

Table 11: show running-config Command Output Description

Field Name	Description
license boot level adventerprise	Indicates the current requested Cisco lOS license level to boot.

Viewing License Information

Use the **show license udi** command to determine the Universal Device Identifier (UDI) information of your chassis. This may be required at the time of purchasing a new license.

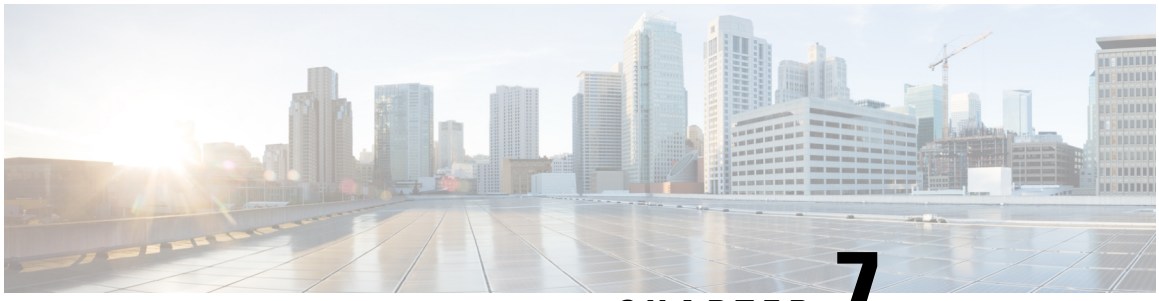
The following example displays sample output from the **show license udi** command:

```
WLC# show license udi
SlotID        PID            SN               UDI
-------------------------------------------------------------------------------
*        C9800-40-K9    xxxxxxxxxxx    C9800-40-K9:xxxxxxxxxxx
```

Evaluation License Features

The wireless controller operates on evaluation mode when the device is not registered. The evaluation mode is for 90 days. After the expiry of the evaluation period, if the wireless controller is not registered to a smart account, the wireless controller will start displaying syslog evaluation expiration messages. These error messages are purely for informational purpose only and will not affect the functionality of the wireless controller.

The number of APs supported on the wireless controller when the wireless controller is on EVAL mode will be equal to the capacity of the wireless controller and the wireless controller will be fully operational. No other license is required to use the wireless controller in evaluation mode.



CHAPTER 7

Factory Reset

- Information About Factory Reset, on page 79
- Prerequisites for Performing Factory Reset, on page 79
- Performing Factory Reset, on page 79
- Performing Secure Erase, on page 80

Information About Factory Reset

Factory reset removes all the customer-specific data that has been added to a device since the time of its shipping. The erased data includes configurations, log files, boot variables, core files, and credentials such as Federal Information Processing Standard-related (FIPS-related) keys.

The device returns to its default license configuration after a factory reset.

Note The factory reset is performed through an IOS CLI. A copy of the running image is backed up and restored after the reset.

Prerequisites for Performing Factory Reset

- Ensure that all the software images, configurations, and personal data are backed up.
- Ensure that there is uninterrupted power supply when the factory reset is in progress.
- Ensure that you take a backup of the current image.

Performing Factory Reset

SUMMARY STEPS

1. **enable**
2. **factory-reset all secure 3-pass**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	**factory-reset all secure 3-pass** **Example:** `Device# factory-reset all secure 3-pass`	Removes sensitive data from all the partitions that are currently being cleaned up by the **factory-reset all** command. From Cisco IOS-XE 17.10 onwards, the following are the three passes to erase data in disk partitions: • Write 0s • Write 1s • Write a random byte **Note** The factory reset takes 3 to 6 hours to be completed.

Performing Secure Erase

SUMMARY STEPS

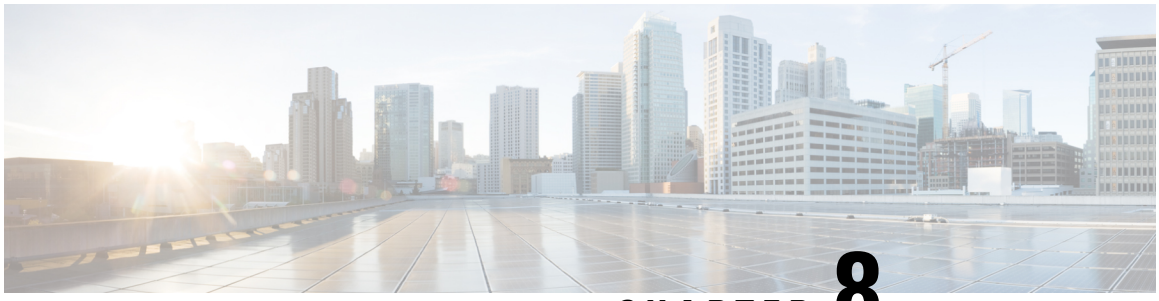
1. **enable**
2. **factory-reset all secure**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	**factory-reset all secure** **Example:** `Device# factory-reset all secure`	Erases all user data and metadata from bootflash. The erase is compliant with the National Institute of Standards and Technology (NIST) standards. **Note**

	Command or Action	Purpose
		The erase takes around 5 to10 minutes. You need to boot a new image from TFTP post the secure erase as the image gets deleted.



CHAPTER 8

Removing and Replacing FRUs

This chapter describes procedures for removing and replacing field-replaceable units (FRUs) from Cisco Catalyst 9800-40 Wireless Controller.

- Removing AC Power Supplies, on page 83
- Installing AC Power Supplies, on page 83
- Removing and Replacing USB Flash Memory Stick, on page 84
- Repacking the Controller, on page 85

Removing AC Power Supplies

Procedure

Step 1 Ensure that the chassis power switch is in the Standby position.

Note
It is not required to place the chassis power switch in the Standby position, if you want to hot-swap a single power supply.

Step 2 Unplug the power cable from the power supply.

Step 3 Press the retaining latch toward the pull handle.

Grasp the handle with one hand, and pull the power supply out of the slot while supporting the weight of the power supply with the other hand.

Step 4 Repeat **step 1** to **step 3**, to remove the other AC power supply.

Installing AC Power Supplies

Note Do not install the power supplies with the chassis cover off.

Procedure

Step 1 Ensure that the chassis power switch on the chassis is in the Standby position.

It is not required to place the chassis power switch in the Standby position, if you want to hot-swap a single power supply.

Step 2 Insert the power supply module into the appropriate slot(s).

Note
Make sure that the retention latch is firmly placed. You can verify that the power supply module is firmly latched by gently pulling the power supply handle.

Step 3 Insert the power supply cables firmly into the power supplies.

Note
Ensure that both power supplies are inserted firmly and the power cords are in place.

Step 4 If you have changed the chassis power switch to the Standby position in **Step 1**, press the power switch to the **On** position. The power supply LEDs are illuminated (green).

Removing and Replacing USB Flash Memory Stick

The Cisco Catalyst 9800-40 Wireless Controller contains the USB ports for a flash memory stick to store configurations or Cisco IOS XE consolidated packages.



Caution Do not remove a USB flash memory stick when issuing a file access command or a read/write operation to the flash memory stick when it is processing. The controller might reload or the USB flash memory stick may get damaged. Before removing the USB device, check to see if the USB activity LED on the front panel is flashing.

To remove and then replace a USB flash memory stick, follow these steps:

Procedure

Step 1 Pull the flash memory stick from the USB port.

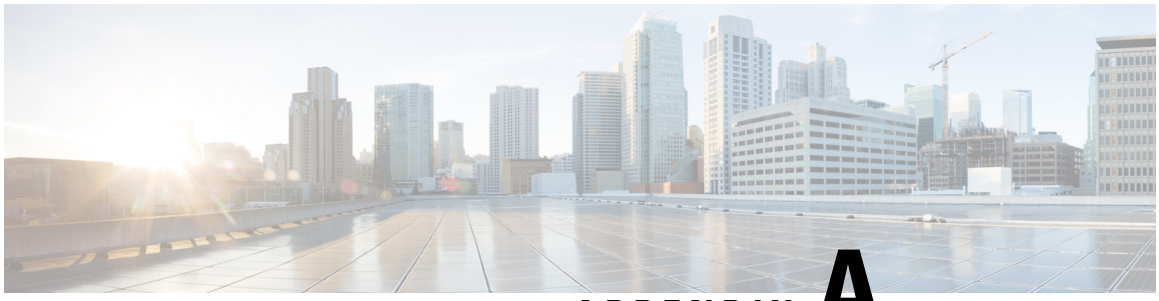
Step 2 To replace a Cisco USB flash memory stick, insert the module into USB port 0 or 1.

The flash memory stick can be inserted only in one way, and can be inserted or removed regardless of whether the controller is powered up or not.

Repacking the Controller

If your system is damaged, you must repack it for return shipment.

Before you return the controller or move it to a different location, repack the system using the original packaging material.



APPENDIX A

Technical Specifications

This appendix provides technical specifications for the Cisco Catalyst 9800-40 Wireless Controller.

• Cisco Catalyst 9800-40 Wireless Controller Specifications, on page 87

Cisco Catalyst 9800-40 Wireless Controller Specifications

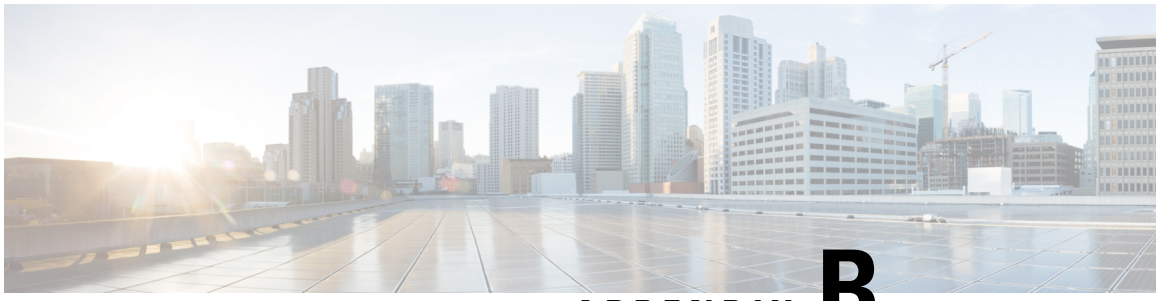
Description	Specification
Dimensions (H x W x D)	Height—1.72 in. (43.69 mm) Width—17.3 in. (439.42 mm) Depth—21.78 in. (553.2 mm) including card handles, cable-management brackets, and power supply handles
Weight	23 lb (10.43 kg) fully loaded
Nominal operating temperature	32° to 104° F (0° to 40° C)
Short-term operating temperature	32° to 122° F (0° to 50° C)
Nominal operating humidity	10 to 90% relative humidity
Short-term operating humidity	5 to 90%
Storage temperature	–4° to 158° F (–20° to +70° C)
Power consumption	Maximum (AC): 381 W

Table 12: Ambient Temperature and Fan Speed

Temperature/Fan Speed	Sound Pressure Level	Sound Power Level
-40° to 25° C (50% fans)[1]	62.2	71.2
26° to 43° C (60% fans)[2]	64.4	74.1
44° to 50° C (75% fans)	69.2	79.2

Temperature/Fan Speed	Sound Pressure Level	Sound Power Level
51° C and above (90% fans)	71.6	81.7

[1] fan speed at typical room ambient temperature.
[2] fan speed at system boot.



APPENDIX B

Port Signals and Pinouts

This appendix provides the port signals and pinout specifications.

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- Console Port Signals and Pinouts, on page 89

Management Ethernet Port Signals and Pinouts

The following table lists the Management Ethernet 10/100/1000 RJ-45 port pinouts.

Pin	Signal	Direction	Description
1	TX/RX AData +	I/O	T/R data +
2	TX/RX AData -	I/O	T/R data –
3	TX/RX BData +	I/O	T/R Data +
4	TX/RX CData +	I/O	T/R Data + (Unused for 10/100)
5	TX/RX CData -	I/O	T/R Data – (Unused for 10/100)
6	TX/RX BData -	I/O	T/R data –
7	TX/RX DData +	I/O	T/R Data + (Unused for 10/100)
8	TX/RX DData -	I/O	T/R Data – (Unused for 10/100)

Console Port Signals and Pinouts

The following table lists the pinouts of the RJ-45 console port.

Pin	Signal	Direction	Description
1	RTS	Output	Request to Send (tied directly to CTS)
2	DTR	Output	Data Terminal Ready (always On)
3	TXD	Output	Transmit Data
4	GND	—	—
5	GND	—	—
6	RXD	Input	Receive Data
7	DSR	Input	Unused
8	CTS	Input	Clear to Send (tied to RTS)